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THE PHYTOLOGIST FOR 1854.

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THE

PHYTOLOGIST:

A

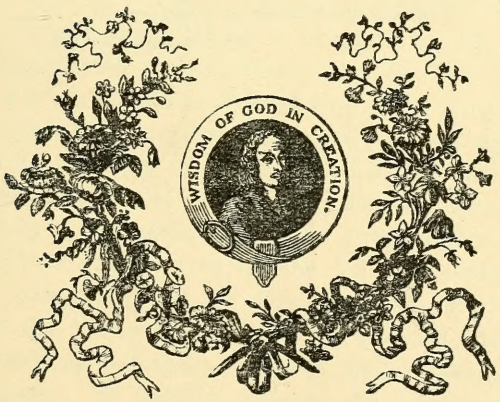
POPULAR

BOTANICAL MISCELLANY.

CONDUCTED BY

EDWARD NEWMAN, F.L.S., Memb. Imp. L.-C. Acad.

VOLUME THE FIFTH.



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LVI.

"O, these are Voices of the Past,
Links of a broken chain,
Wings that can bear me back to times
Which cannot come again;
Yet God forbid that I should lose
The echoes that remain!"

ANON.

"Yet though thou fade,
From thy dead leaves let fragrance rise."

HENRY KIRK WHITE.

PREFACE.

Mr. Luxford, the able superintendent of the 'Phytologist,' died, at his residence in Hill Street, Walworth, on Monday, the 12th of June, in the forty-eighth year of his age. He was born at Sutton, in Surrey, on the 7th of April, 1807, but shortly removed to Reigate, where, at the early age of 11, he was placed under Mr. Allingham, a printer and stationer. Mr. Allingham's kindness, care and judgment, exercised for a period of sixteen years, tended mainly to the attainment of that useful knowledge which Mr. Luxford eventually possessed. While with Mr. Allingham he not only mastered the printing business, but also gained an intimate acquaintance with the Greek, Latin and French languages, and a vast store of historical, geographical, literary and scientific information. At a very early age he made Botany his favourite study, and the neighbourhood of Reigate was the field in which he devotedly pursued it. In 1834 he removed to Birmingham, taking a situation in the engraving and printing establishment of Mr. Allen; and in 1837 he commenced business as a printer in Ratcliff Highway. The next year he wrote, printed and published the 'Flora of Reigate,' a work that bears ample testimony to the accuracy and extent of his botanical acquirements. In 1841 he commenced the 'Phytologist,' superintendence over which he exercised up to the publication of the June number. In 1844 Mr. Luxford obtained employment on the 'Globe' newspaper, which, however, he relinquished in the following year, and took the subeditorship of the 'Westminster Review,' reading and revising the whole, and writing the shorter notices and occasionally the more important papers. In 1846 he obtained the Lectureship on Botany at St. Thomas's Hospital. In 1851 he gave up both these engagements, and came to Devonshire Street, where he continued, as compositor and reader, up to the time of his death.

The 'Phytologist' never was successful as a commercial speculation: the candid and impartial tone of the reviews, mostly written by men of the highest botanical standing, prevented this. The botanical public is a very small public, and a very literary public; and to secure its favour you must laud A with a sort of monthly *jubilate*, you must conceal the blunders of B, you must insert the cauticities of C and the high-sounding nothings of D. An Editor of any feeling winces under such restrictions; an Editor of any truthfulness abhors such restrictions; an Editor of any spirit throws off such restrictions. What is the consequence? A, B, C and D refuse to write for you, and refuse in a dignified manner, as men who have a right to dictate; they write to each other, they write to strangers, to E, F, G—Z, whose names they observe as contributors, and state the withdrawal of their patronage, and their regret that E, F, G—Z should still continue to write in such a Journal. So A—Z all withdraw their assistance, as far as writing is concerned, and leave only the outsiders to contribute. The effect is soon obvious: the quality of the article is deteriorated, because the producers are incompetent. A, with glittering eyes, writes to B, his old opponent, deeply regretting the evident deterioration, B passes the plaint on to C, with additions; and so it goes down to Z. The next step is to apprise the Editor that unless better matter is given they must all decline to read the 'Phytologist;' they regret—people doing either an unjust or unkind thing always regret—they regret their indisposition to purchase what gives them so little information. They cease to take it. Still, the 'Phytologist' crawls on, like the poor tortoise whose brains were cleared out by a cruel experimenter, until an event occurs beyond the reach of human skill or human ingenuity, and the only tie between the 'Phytologist' and its proprietor is broken.

EDWARD NEWMAN.

November, 1856.

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MARINE BIOLOGICAL LABORATORY WOODS HOLE LIBRARY

THE PHYTOLOGIST

FOR 1854.

A Catalogue of the Wild Plants of Gosforth (Cumberland) and adjacent District, in 1853. By Mr. Joseph Robson.

In compiling the following Catalogue, I have omitted many plants whose habitats are almost everywhere. At the same time, I have added a few, possessing uncommon interest, whose localities are beyond the bounds of the Gosforth district.

Thalictrum minus. Great End, Scawfell.
„ *alpinum.* Great End, Scawfell.
„ *majus.* Wastdale Head and Eskmeals.
Ranunculus Lingua. Wastdale, Eskdale, &c., &c.
„ *Flammula.* Wastdale, Eskdale, &c., &c.
„ *hederaceus.* Drigg, roadside ditches.
„ *arvensis.* Nethertown.
Trollius Europæus. Miteside, Ravenglass, meadows.
Aquilegia vulgaris. Gosforth woods.
Nymphæa alba. Braystones Tarn.
Nuphar lutea. Braystones Tarn.
Glaucium luteum. Nethertown and Couldertown, sea-shore.
Chelidonium majus. St. Bees, roadside.
Fumaria lutea. Wastwater foot.
„ *officinalis.* St. Bees Valley.
„ *claviculata.* Dalegarth.
Subularia aquatica. Ennerdale Lake.
Cochlearia officinalis. Scawfell.
„ *anglica.* St. Bees Heads.
Crambe maritima. Couldertown Point, sea-shore.

* Communicated by Walter Buchanan, Esq., F.L.S.

Cakile maritima. Couldertown Point, sea-shore.
Draba incana. Wastdale.
„ *verna.* Wastdale.
Arabis petræa. Scawfell.
Brassica campestris. St. Bees Valley.
„ *Monensis.* Couldertown Point, sea-shore.
Drosera rotundifolia. Wastwater, roadside.
„ *longifolia.* Ulpha.
Silene acaulis. Great End and Mickledore crags.
„ *maritima.* St. Bees Heads.
„ *inflata.* Gosforth Bottom.
Lychnis vespertina. Nethertown and St. Bees.
Sagina procumbens. Clints Brow, Egremont, limestone rock.
Spergula nodosa. St. Bees shore.
Stellaria glauca. Muncaster woods.
Malva moschata. Eskdale roadside.
Hypericum montanum. Cold Fell.
„ *calycinum.* Irton woods.
„ *elodes.* Wormgill; Calder river.
Geranium phæum. Strands, Netherwasdale.
„ *sylvaticum.* Gosforth Bottom.
„ *sanguineum.* Sea-shore, Sea Scale, &c.
„ *Columbinum.* Sea-shore, Sea Scale, &c.
Erodium cicutarium. Gosforth Bottom.
Impatiens Noli-me-tangere. Duddon Bridge.
Ononis arvensis. Sea-scale, shore.
Anthyllis Vulneraria. Nethertown.
„ „ A pretty yellow variety, Nethertown.
Pisum maritimum. Rocks near Whitehaven.
Vicia sylvatica. Rocks near Whitehaven.
Lathyrus sylvestris. Rocks near Whitehaven, rare.
„ *pratensis.* Gosforth Bottom.
Genista Scoparia. Drigg Moor.
„ *tinctoria.* Drigg Moor.
„ *anglica.* Drigg Moor.
Ulex nanus. Gosforth, commons.
Trifolium maritimum. Braystones shore.
Hedysarum Onobrychis. Nethertown.
Ornithopus perpusillus. Braystones railway-station.
Prunus Padus. Irton woods.
„ *Cerasus.* Irton woods.

Prunus insititia. Eskdale.
„ *spinosa.* Eskdale.
Spiræa Filipendula. Gosforth meadows.
„ *Ulmaria.* Gosforth meadows.
Geum rivale. Gosforth woods.
„ *urbanum.* Gosforth woods.
Sanguisorba officinalis. Gosforth fields.
Agrimonia Eupatoria. Cleator, Ennerdale.
Alchemilla alpina. Scawfell and Pillar mountains.
Potentilla fruticosa. Wastwater screes.
Comarum palustre. Gosforth marshes.
Rubus corylifolius. Frizzington, Ennerdale.
„ *rhamnifolius.* Ulpha.
„ *cæsius.* Furness Abbey.
Rosa spinosissima. Sea Scale shore.
Pyrus Aria. Eskdale, Dalegarth.
„ *Aucuparia.* Eskdale mountains.
Lythrum Salicaria. Gosforth, banks of Irt.
„ *hyssopifolium.* Wastdale, roadside ; Langthatch.
Peplis Portula. Harras Moor, Whitehaven.
Isnardia palustris. Lizza, Ennerdale.
Circæa lutetiana. Gosforth woods.
Myriophyllum spicatum. Ennerdale.
Hippuris vulgaris. Dubbeck Cleator.
Montia fontana. Cold Fell springs.
Scleranthus annuus. Nethertown.
Cotyledon Umbilicus. Old wall, Langthatch ; Gosforth Bottom.
Sempervivum tectorum. Roadside, Gosforth Bottom.
Sedum acre. Braystones.
„ *villosum.* Braystones.
Rhodiola rosea. Wastwater screes and Mickledore.
Ribes alpinum. Corney Fell.
„ *rubrum.* Gosforth woods and hedges.
„ *Grossularia.* Gosforth woods and hedges.
Saxifraga stellaris. Ennerdale mountains.
„ *aizoides.* Wastdale Head.
„ *hypnoides.* Mickledore, Scawfell.
„ *nivalis.* Scawfell, near the summit.
„ *oppositifolia.* Wastwater screes.
„ *granulata.* Cleator, Ennerdale.
„ *tridactylites.* Furness Abbey ; Whicham, Bootle.

Hydrocotyle vulgaris. Ennerdale.
Sanicula Europæa. Egremont.
Eryngium maritimum. Sea-shore, Braystones, &c.
Sium nodiflorum. Gill, Egremont.
Meum Athamanticum. Ennerdale.
Heracleum Sphondylium. Irton woods.
Daucus Carota. Nethertown.
Myrrhis odorata. Drigg railway-station.
Conium maculatum. St. Bees.
Chærophyllum sylvestre. Gillfoot Lodge, Egremont.
Crithmum maritimum. St. Bees Heads.
Adoxa Moschatellina. Gosforth, roadside.
Cornus sanguinea. Gosforth, roadside.
Lonicera Xylosteum. St. Bees.
Galium verum. Braystones shore.
Sherardia arvensis. Irton and St. Bees.
Valeriana dioica. Kinneyside, Ennerdale.
„ *officinalis.* St. Bees, &c.
„ *pyrenaica.* Eskdale.
Scabiosa columbaria. Nerthertown.
„ *arvensis.* Nethertown.
„ *succisa.* Nethertown.
Eupatorium Cannabinum. Gosforth village.
Senecio sarracenicus. Moresby, Whitehaven.
„ *sylvaticus.* St. Bees.
„ *viscosus.* Nethertown.
Apargia hispida. Ennerdale.
„ *autumnalis.* Ennerdale.
Aster Tripolium. Ravenglass, salt-marsh.
Solidago Virgaurea. Cold Fell rocks.
Prenanthes muralis. Eskdale.
Inula Helenium. Coulderton Point.
„ *dysenterica.* St. Bees Heads.
Gnaphalium dioicum. Ennerdale and Wastdale.
„ *germanicum.* Nethertown.
„ *minimum.* Nethertown.
„ *uliginosum.* Cold Fell.
Chrysanthemum Leucanthemum. Gosforth Bottom.
„ *segetum.* Nethertown, railway-bank.
Pyrethrum Parthenium. Nethertown.
Anthemis maritima. Coulderton shore.

Achillea Millefolium. St. Bees.
Bidens tripartita. Nethertown shore.
Cnicus acaulis. Ennerdale.
Cichorium Intybus. Hensingham, near Whitehaven.
Hieracium sabaudum. Side, Ennerdale.
„ *atratum.* Wastdale Head.
„ *aurantiacum.* Holm Rook woods.
„ *alpinum.* Scawfell.
„ *umbellatum.* Wastdale.
Artemisia vulgaris. Gosforth village.
„ *maritima.* Coulderton Point and Muncaster.
Petasites vulgaris. Banks of Irt.
Cineraria campestris. Cold Fell.
Tragopogon pratensis. Whitehaven meadows.
Lobelia Dortmanna. Ennerdale Lake.
Campanula latifolia. Gosforth Bottom woods.
„ *rotundifolia.* Haycock and Scawfell.
Jasione montana. Nethertown, and Drigg shore.
Andromeda polifolia. Moresby, near Whitehaven.
Calluna vulgaris, alba. Weddicar-rig, Cleator.
Erica Tetralix, plena. Harras Moor. A beautiful variety.
Arbutus Uva-ursi. Corney Fell; Bootle.
„ *alpina.* Scawfell.
Vaccinium Vitis-idæa. Iron Crag, Ennerdale.
Gentiana campestris. Braystones.
Erythræa Centaurium. Braystones.
„ „ var. *littoralis.* Braystones.
Menyanthes trifoliata. Sellafield Tarn.
Villarsia nymphæoides. Sellafield Tarn.
Polemonium cæruleum. St. Bees.
Convolvulus sepium. Gosforth.
„ *Soldanella.* Braystones shore.
Anchusa sempervirens. St. Bees.
Lycopsis arvensis. St. Bees.
Echium vulgatum. Coulderton, railway-bank.
Myosotis palustris. Braystones.
„ *versicolor.* Sea-scale.
Lithospermum maritimum. Eskmeals; Ravenglass.
Borago officinalis. St. Bees.
Verbascum Thapsus. Coulderton Point.
Atropa Belladonna. Furness Abbey.

Hyoscyamus niger. Coulderton.
Antirrhinum Orontium. Gosforth, hedges.
Scrophularia nodosa. Gosforth, river-side.
Melampyrum sylvaticum. Wilton Haile.
Pedicularis palustris. Nethertown.
„ *sylvaticus.* Gosforth Bottom.
„ „ var. *alba.* Wastwater, roadside half-way up the lake.
Lycopus Europæus. Sellafield Tarn.
Thymus Serpyllum, var. *tomentosus.* Braystones.
Scutellaria galericulata. St. Bees Valley.
„ *minor.* Gill, Egremont.
Galeopsis versicolor. St. Bees.
„ *Tetrahit.* St. Bees.
„ *Ladanum.* St. Bees.
Galeobdolon luteum. Crossdale ; Ennerdale.
Stachys palustris. Sellafield Tarn.
Lamium album. St. Bees.
„ *purpureum.* St. Bees.
Teucrium Scorodonia. Bleng Fell.
Verbena officinalis. Irton.
Pinguicula vulgaris. Cold Fell and Wastdale.
Utricularia minor. Sellafield Tarn.
Lysimachia thyrsiflora. Sellafield Tarn.
„ *nemorum.* Irton woods.
„ *Nummularia.* Irton woods.
Glaux maritima. Ravenglass, salt-marsh.
Samolus Valerandi. St. Bees and Waberthwaite.
Statice Armeria. Sea-shore and mountains, Scawfell, &c.
„ *Limonium.* St. Bees Heads.
„ *spathulata.* St. Bees Heads.
Plantago major. Langhorn, Egremont.
„ *media.* Langhorn, Egremont.
„ *Coronopus.* St. Bees shore.
„ *maritima.* Gillerthwaite, Ennerdale.
Chenopodium maritimum. Coulderton shore.
Salsola Kali. Coulderton shore.
„ *fruticosa.* Ravenglass shore.
Salicornia herbacea. Ravenglass shore.
Atriplex laciniata. St. Bees.
Polygonum Bistorta. St. Bees Valley.

Polygonum Convolvulus. St. Bees Valley.
„ *amphibium.* St. Bees Valley.
„ *Persicaria.* St. Bees Valley.
„ *mite.* St. Bees Valley.
Oxyria reniformis. Mickledore; Scawfell.
Empetrum nigrum. Lingmell and all mountains.
Euphorbia Peplus. Egremont.
„ *Helioscopia.* Gosforth, cornfields.
Mercurialis perennis. Eskdale; Dalegarth.
„ *annua.* Eskdale; Dalegarth.
Urtica dioica. Calder Abbey.
„ *urens.* Calder Abbey.
Humulus Lupulus. Gosforth, hedges.
Salix herbacea. Summits of Pillar, Scawfell, &c.
Myrica Gale. Wastdale, bogs; common.
Taxus baccata. Middlefell, Wastwater.
Juniperus nana. Wastwater screes.
Alisma Plantago. Braystones Tarns.
„ *natans.* Braystones Tarns.
„ *ranunculoides.* Braystones Tarns.
Sagittaria sagittifolia. Braystones, ditches.
Butomus umbellatus. Irton, pond.
Typha latifolia. Irton, pond.
Sparganium natans. Dubbeck Cleator.
„ *simplex.* Harras Moor.
Lemna trisulca. Wet ditches, Gosforth.
„ *minor.* Wet ditches, Gosforth.
Potamogeton lucens. Calder Gills.
„ *pusillus.* Calder Gills.
„ *rufescens.* Calder Gills.
Convallaria majalis. Dalegarth; coppice near Bridge.
Paris quadrifolia. Bell House Gill, St. Bees Valley.
Narthecium ossifragum. Wastdale, common on mosses.
Juncus trifidus. Hardknot, Eskdale.
„ *compressus.* Kinniside, common; Ennerdale.
„ *acutiflorus.* Kinniside, common; Ennerdale.
Stratiotes aloides. Ennerdale Lake, near Smithy Beck, 1852, rare.
Orchis bifolia. Between Sea Scale and Gosforth, very fine.
„ *latifolia.* Between Sea Scale and Gosforth.
„ *mascula.* Gosforth Bottom.
„ *Morio.* Gosforth Bottom.

Orchis maculata. Gosforth Bottom.
„ *pyramidalis.* Gosforth Bottom.
Gymnadenia conopsea. Muncaster Mill, Ravenglass; Ennerdale.
Herminium Monorchis. Cleator, Ennerdale.
Listera ovata. Ravenglass.
„ *cordata.* Ravenglass.
Epipactis grandiflora. Bleng river, above Gosforth.
Iris pseud-acorus. Common in marshes.
Narcissus Pseudo-narcissus. Banks of Irt.
Rhynchospora alba. Corney Fell; Ravenglass.
Eleocharis multicaulis. Ennerdale Lake.
„ *acicularis.* Ennerdale Lake.
Eriophorum vaginatum. Drigg Moor.
„ *angustifolium.* Drigg Moor.
Phalaris arundinacea. Irton.
Lomaria spicant. Common on heaths and roadsides.
Pteris aquilina. Common on heaths.
Allosorus crispus. Wastdale, common on old walls.
Polypodium vulgare. Wastdale, common.
„ *Phegopteris.* Laggat, on Cold Fell.
„ *Dryopteris.* Dalegarth, below the waterfall.
„ „ var. *calcareum.* Scale Force.
Cystopteris fragilis. Holm Rook, on old wall; and Mickledore.
„ *dentata.* Braithwaite Brow, Egremont.
Polystichum aculeatum. Irton woods.
Lastrea Thelypteris. Irton woods.
„ *Oreopteris.* Hawl Gill, Wastwater.
„ *recurva.* St. Bees Heads.
Athyrium Filix-fœmina. Ennerdale.
Asplenium Adiantum-nigrum. Holm Rook; Calder Abbey.
„ *Ruta-muraria.* Calder Abbey.
„ *Trichomanes.* Calder Abbey.
„ *marinum.* St. Bees Heads, very fine.
„ *septentrionale.* Borrowdale.
Scolopendrium vulgare. Egremont, &c., common.
„ var. with forked fronds. On conglomerate rock near Whitehaven, plentiful.
Grammitis Ceterach. On a wall by the roadside, Gosforth, rare in Lake district.
Hymenophyllum Tunbridgense. Hawl Gill, Wastwater.
„ *Wilsoni.* Dalegarth, plentiful.

Osmunda regalis. Sea Scale, Gosforth, &c., common.
Botrychium Lunaria. Braystones, and Muncaster Fell.
Ophioglossum vulgatum. St. Bees meadows, plentiful.
Lycopodium clavatum. Wastwater screes.
„ *alpinum.* Wastwater screes.
„ *inundatum.* Wastdale, side of lake.
„ *Selago.* Ennerdale Fells.
„ *Selaginoides.* Ennerdale Fells.
Isoetes lacustris. Ennerdale Lake, and Lizza.
Equisetum fluviatile. Irt banks.
„ *arvense.* Gosforth cornfields.
„ *sylvaticum.* Irton woods.
„ *limosum.* Ennerdale, near lake.
„ *palustre.* Thwaites, Cold Fell.
Pilularia globulifera. Ennerdale Lake.
Chara flexilis. Ennerdale Lake.
„ *aspera.* Ennerdale Lake.

JOSEPH ROBSON.

July 4, 1853.

On preserving the Balance between the Animal and Vegetable Organisms in Sea Water. By R. WARINGTON, Esq.*

IN the published notices of my experiments of 1849, to maintain the balance between the animal and vegetable organisms in a confined and limited portion of water, the fact was demonstrated, that, in consequence of the natural decay of the vegetation, its subsequent decomposition and the mucus-growth to which it gave rise, this balance could only be sustained for a very short period, but, if another member were introduced, which would feed upon the decaying vegetation and thus prevent the accumulation of these destructive products—a function most admirably performed by the various species of water-snail—such balance was capable of being continuously maintained without the slightest difficulty; and I may add, that the experimental proof of this has now been carried on, in a small tank in the heart of London, for the last four years and a half, without any change or disturbance of the water; the loss which takes place by evaporation being made up with rain or distilled water, so as to avoid any

* Read at the Hull Meeting of the British Association, and communicated by the Author, for publication in the 'Phytologist.'

great increase of the mineral ingredients originally present. It follows then, as a natural deduction, from the successful demonstration of these premises, that the same balance should be capable of being established, under analogous circumstances, in sea water. And in a paper published in January, 1852,* I stated that I was, at that time, "attempting the same kind of arrangement with a confined portion of sea water, employing some of the green sea-weeds for the vegetable member of the circle, and the common periwinkle as the representative of the water-snail."

The sea water with which the experiments I am about to detail were conducted, was obtained through the medium of one of the oyster-boats at the Billingsgate fish-market, and was taken from the middle of the English Channel.

My first object was to ascertain the kind of sea-weed best fitted, under ordinary circumstances, for keeping the water clear and sweet, and in a sufficiently oxygenated state to sustain animal life. And here opinions were at variance, for one naturalist friend whom I consulted, advised me to employ the Rhodosperms; another stated that it was impossible to make the red weeds answer the purpose, as he had tried them, and strongly recommended the olive or brown-coloured Algæ; while, again, others thought that I should be more successful with those which had in theory first suggested themselves to my own mind, namely the Chlorosperms. After making numerous unsuccessful experiments with both the brown and the red varieties of Algæ, I was fully convinced that, under ordinary circumstances, the green weeds were the best adapted for the purpose.

This point having been practically ascertained, and some good pieces of the Enteromorpha and Ulva latissima in a healthy state, attached to nodules of flint or chalk, having been procured from the shore near Broadstairs, several living animal subjects were introduced together with the periwinkle. Everything progressed satisfactorily, and these all continued in a healthy and lively condition.

My first trials were conducted in one of the small tanks which had been used for fresh water; but as it was necessary, during the unsuccessful experiments with the brown and red sea-weeds, to agitate and aërate the water, which had been rendered foul from the quantity of mucus or gelatinous matter generated during the decay of their fronds, until the whole had become oxidized, and the water rendered clear and fitted for another experiment, it was, therefore, for greater convenience, removed into a shallow earthen pan and covered with a large

* 'Gardeners' Botanical Magazine and Garden Companion,' Jan. 1852.

glass shade to protect the surface of the water, as much as possible, from the dust and soot of the London atmosphere, and at the same time impede the evaporation. In this vessel then I had succeeded perfectly in keeping a large number of beautiful living specimens in a healthy condition up to the close of 1852. I therefore gave instructions for the making of a small tank as a more permanent reservoir, and one more adapted for carrying on my observations and investigations on the œconomy and habits of the inhabitants.

From the experience I had obtained in my experiments with the freshwater tank, I was induced to modify slightly the construction of this vessel; thus, at the back, or part towards the light, the framing was filled with slate in the same way as the ends and bottom; for I had found that the glass, originally employed, very soon became covered with a confervoid growth which had an unpleasing appearance to the eye, and in consequence of which I had been obliged to paint the glass on the exterior to prevent this growth from increasing to too great an extent. It was also an unnatural mode of illumination, as all the light should pass through the surface of the water. The front towards the room and the observer was constructed of plate glass, the whole being set in a stout framework of zinc, and cemented with what is known under the name of Scott's cement, and which I have found to answer for the purpose most admirably. Within this tank were arranged several large pieces of rock-work, thrown into an arched form, and other fragments were cemented in places against the slate at the back and ends, and at parts along the water-line, so that the creatures could hide themselves at pleasure; a short beach of pebbles was also constructed in order that shallow water could be resorted to if desired. The whole tank was covered with a light glass shade to keep out the dust and retard evaporation.

With the sea water obtained in January, 1852, I have been working without cessation up to the present time, agitating* and aërating when it became foul during the unsuccessful experiments on the sea-weeds, but since then it has been rarely ever disturbed; the loss which takes place from evaporation being made up, as before stated, with rain or distilled water.

For a considerable period, after commencing these experiments, I was much troubled to obtain living subjects in a healthy condition, but having alluded to this, and the success of my investigations, in a short notice appended to a paper published in the 'Annals' for

* It must be decidedly understood that no agitation or so-called aëration is required when the balance of animal and vegetable life is properly established.

October, 1852 (see also Zool. 3633), my friend, Mr. P. H. Gosse, who was then sojourning at Ilfracombe for his health, offered in the kindest manner possible to supply me with materials, and from that period he has always most heartily responded to my wants. It must not be imagined for a moment that the beautiful creatures I have thus received have been all preserved alive or always quite healthy. In experimental investigations this would be unreasonable to expect, as the very fact of experimenting implies a disturbance of the then state of things. Besides which, from want of a sufficient knowledge of Natural History, from want of forethought and experience and other causes, I have lost many very fine specimens; and as the detail of these losses may prevent the occurrence of the like annoyances to others, I shall venture to occupy your time for a short period with their history.

My greatest loss arose from too great an anxiety to transfer the collection I had preserved in a healthy condition to the end of December, 1852, into the new tank. As soon as it arrived from the maker's I lost no time in introducing my numerous family to their new abode, and dearly I paid for my precipitancy, for on the next morning I found many of my most beautiful specimens dead; thus I lost two fine Holothurias (*H. Pentactes*), a small freckled goby (*Gobius minutus*), a beautiful little pipe-fish (*Syngnathus lumbriciformis*), and several others, and on opening the door of the case the cause of this mortality was at once evident,—an iridescent film of oily matter was floating on the surface of the water, arising from the paint with which the angular joints and edges of the small tank had been coloured not having become sufficiently hardened.

Another source of loss arises from the several creatures attacking and devouring each other, and it therefore becomes a point of great importance—and highly necessary to be carefully observed, where their preservation is an object—to ascertain what varieties may be safely associated in the same tank; as, for instance, I have found that the shrimps and prawns attack, and very soon devour, all the larger varieties of corallines and Polyps, Sabellæ, Serpulæ, rock-borers, Cirrhipeds, some of the Annelids, many bivalve and univalve mollusks that are unprotected by an operculum, or have no power of closing their valves. The instances which have come under my own immediate observation have been the destruction of the Pholas dactylus, Saxicava rugosa, Cypræa Europæa, and several specimens of Sabellæ, Serpulæ, Coryne sessilis, and many others.

The common crab (*Cancer Mœnas*) is likewise a most destructive

agent; and the tribe of rock-fish, the blennies, gobies, &c. are also most voracious, devouring all the varieties of Cirrhipeds, corallines, Polyps, Annelids, &c.; they will also attack the shrimps and prawns, and even seize upon the horns of the periwinkle, which they bite off. If the mollusks do not keep a very firm hold of the rock or tank sides, they are rapidly turned over by these fish on their backs and lie helplessly exposed to their attacks.* It is doubtless their seeking food of this kind which causes these little fish to be so generally found in the shallow rock-pools of the coast. In consequence of these ravenous propensities, I have been obliged to establish several small tanks and imitation rock-pools, so as to separate these various depredators from each other: thus in one I have varieties of Actinia, shrimps, Nudibranchs, Holothurias, and some Annelids; in a second the rock-fish, as the blennies, gobies, Cottus, with crabs and Actiniæ; in a third corallines, Annelids, Polyps, rock-borers, Sabellæ, Serpulæ, Holothurias, and Actiniæ.

Another curious instance of loss I may detail which has quite recently occurred, and which may prove interesting; it was in a small rock-pool containing blennies, gobies, crabs, &c. I had procured two live oysters for the purpose of feeding my numerous small fry in these vivaria, and one of these having proved ample for the purpose of one meal, the other was placed on the sandy bottom; on the second day after this the oyster was observed to have opened the valves of his shell to a great extent, which were afterwards seen closed, but a small Gobius niger, inhabiting the pool, could nowhere be seen. The day after this the oyster was opened for the general feeding, when, lo! within the shell was found the unfortunate Gobius, quite dead. Whether this little gentleman had been attracted within the trap by curiosity or the ciliary motion of the oyster, it is impossible with certainty to say; but that he must have seized on some sensitive part of the oyster is more than probable, so as to have caused such a rapid closing of the valves of the shell as could entrap so active a burglar.

* Since the reading of this paper at Hull I have received a blenny of larger size, being about 3½ inches in length, and although it has become so tame that it will allow itself to be touched by the hand and takes its food from the fingers, yet its destructive propensities are so great, that it very soon killed four small crabs; and to save three others, of rather a larger size, I have been obliged to remove the blenny to a rock-pool in association with his own species and a few Actiniæ. The only refuge the poor crabs had was to bury themselves in the sand, and whenever they attempted to move out of their refuge they were immediately pounced upon and only escaped by burrowing rapidly again.

Another important point is the gravity of the sea water; this should be very carefully regulated, for it must be borne in mind that many of the marine creatures are supplied by a permeation of water through their tissues or over their delicate and beautiful organs. The specific gravity should not rise above 1.026 at 60° Fahr., and a small hydrometer should be at short periods introduced to ascertain that this point is not exceeded, particularly during the hot months of summer. The reduction to this gravity can be readily effected by the addition of rain or distilled water. Many of the creatures will of themselves afford indications of this increase of density; some of the Actiniæ will remain closed and become coated with a white slimy covering within which they remain for a length of time, and if the specific gravity of the water be lowered this is very soon ruptured by their expansion, thrown off, and the tentacula become soon extended.

All putrescent matter or excess of food or rejecta of the Actiniæ should be carefully removed from the water, as the noxious gaseous compounds generated by the decay of such matters appear to diffuse themselves rapidly through the water, act as a virulent poison, and speedily destroy the vitality of the occupants. Thus many beautiful subjects were lost in a few hours from the introduction, into a small glass jar, of a large Pecten shell, encrusted with corallines, which had become loaded with putrescent matter by partial submersion in a foul muddy bottom.

Great care should also be taken in moving the Actiniæ that the foot or sucking disk with which it attaches itself to the rocks, stones, or weed, be not injured, as, when this occurs, they rarely survive, but roll about without attaching themselves, and gradually waste away and die.

With these exceptions then, everything has gone on very satisfactorily, care being always taken not to overload the water with too large a proportion of animal life for the vegetation to balance, as, whenever this has been inadvertently attempted, the water has soon become foul, and the whole contents of the tank, both animal and vegetable, have rapidly suffered, and it has required some time before the water could be restored to its former healthy condition.

In one of the numbers of the 'Zoologist' of last year, I stated that besides the Ulvæ, Enteromorphæ and Cladophoræ, I had found the Zostera marina a very useful plant for oxygenating the sea water; but this observation has reference only to the case of a tank supplied with a ground where its roots will find a sufficiency of food for its growth, as in a clear shingle or sand it soon decays; and it should be asso-

ciated with such animals as delight in a ground of this nature, as many of the Annelids, crabs, burrowing shrimps, &c. There are several interesting observations which have been made from time to time connected with this subject, which I hope to lay before the Natural-History world as soon as I can find leisure time for the purpose.

Robert Warington.

Apothecaries' Hall,
September 10, 1853.

Notices of New Books.

'*The Microscope, in its Special Application to Vegetable Anatomy and Physiology.* By Dr. Hermann Schacht; translated by Frederick Currey, Esq., M.A. London: Samuel Highley, 32, Fleet Street. 1853.' 132 pp. 8vo; with numerous Illustrations on Wood. Price 5*s*.

The translator's Preface, which we extract entire, will explain the character and objects of this publication.

"The work of Dr. Schacht, of which a translation is now offered to the public, relates to a branch of microscopical science, which has not hitherto formed the subject of a separate treatise; and the high reputation of the author, and the interesting nature of the subject, have induced a belief that the present version is likely to meet with a favourable reception.

"It has been thought advisable to omit the greater part of the description of foreign microscopes and auxiliary instruments contained in the original work. These details would, for obvious reasons, be uninteresting, if not useless, to the English reader. There is no doubt of the superiority of English instruments over those described by Dr. Schacht; and the elaborate and able treatise of Professor Quekett affords all the necessary information upon the subject of English microscopes, &c.

"The high price of good English microscopes has hitherto been an impediment to the progress of Microscopy, and much attention has lately been directed to the production of cheaper instruments. A very useful and convenient form of student's microscope is represented

in the frontispiece, which has been designed by Mr. Samuel Highley, jun., of Fleet Street, and may be had at a very moderate price.

" The figures of the original work, and their descriptions, have been incorporated into the text of the translation, by which means the inconvenience of constant reference to the plates and their explanation is avoided. The figures of the foreign instruments, and a few other figures, which were not essential for the elucidation of the subject, and which would have increased the expense of the translation, have been omitted."

'*The Botany of the Voyage of H.M.S. Herald.* By Berthold Seemann, F.L.S., &c., Naturalist to the Expedition. Part III. Flora of the Isthmus of Panama continued. London: Reeve. 1853.' Royal 4to; 40 pp. Text; 10 Lithographic Plates. Price 10*s.*

The Part contains, 2 Caryophylleæ, 21 Malvaceæ, 9 Sterculiaceæ, 9 Buttneriaceæ, 11 Tiliaceæ, 4 Ternstrœmiaceæ, 1 Olacineæ, 6 Aurantiaceæ, 3 Hypericineæ, 10 Clusiaceæ, 4 Marcgraaviaceæ, 5 Hippocrateaceæ, 1 Erythroxyleæ, 14 Malpighiaceæ, 12 Sapindaceæ, 4 Meliaceæ, 1 Tropeoleæ, 2 Oxalideæ, 1 Zygophylleæ, 2 Anthoxyleæ, 5 Simarubaceæ, 2 Ochnaceæ, 2 Rhamneæ, 6 Samydeæ, 32 Euphorbiaceæ, 5 Anacardieæ, 119 Leguminosæ, 1 Burseraceæ, 6 Chrysobalaneæ, 3 Rosaceæ, 7 Combretaceæ, 1 Vochysieæ, 1 Rhizophoreæ, 7 Onagrarieæ.

The novelties are forty-eight in number, and bear the following names:—

Pavonia alba, *Seem.;* order Malvaceæ.

Pachira Fendleri, *Seem.*, P. Barrigon, *Seem.*, and Chorisea rosea, *Seem.;* order Sterculiaceæ.

Kelletia odorata, *Seem.*, Sloanea quadrivalvis, *Seem.*, Heliocarpus arborescens, *Seem.*, Triumfetta speciosa, *Seem.;* order Tiliaceæ.

Saurauja montana, *Seem.;* order Ternstrœmiaceæ.

Hypericum gnidioides, *Seem.;* order Hypericineæ.

Reggeria acuminata, *Seem.*, Clusia odorata, *Seem.*, C. pratensis, *Seem.*, Calophyllum edule, *Seem.;* order Clusiaceæ.

Salacia pruinosa, *Seem.;* order Hippocrateaceæ.

Tetrapteris Panamensis, *Seem.;* order Malpighiaceæ.

Sergania grandis, *Seem.*, Cupania sylvatica, *Seem.;* order Sapindaceæ.

Moschoxylon Veraguasense, *Seem.*; order Meliaceæ.

Picramnia umbrosa, *Seem.*; order Simarubaceæ.

Cespedesia macrophylla, *Seem.*; order Ochnaceæ.

Edmonstonia pacifica, *Seem.*; order Samydeæ. "Named in commemoration of Mr. Thomas Edmonston, a native of Buness, North Britain." The melancholy fate of this young botanist will still be fresh in the recollection of our readers.

Euphorbia apocynoides, *Kl. MSS.*, Euphorbia Morisoniana, *Kl. MSS.*, Sapium Moritzianum, *Kl. MSS.*, Omphalia diandra, *Linn.*, var. Panamensis, *Kl. MSS.*, Acalypta Panamensis, *Kl. MSS.*, A. Seemanni, *Kl. MSS.*, A. Alopecuroidea, *Jacquin*, var. *glandulifera*, Kl. MSS., Caperonia Panamensisis, *Kl. MSS.*, Astræa Seemanni, *Kl. MSS.*, Barhamia Panamensis, *Kl. MSS.*, Cyclostigma Panamense, *Kl. MSS.*, C. denticulatum, *Kl. MSS.*; order Crotoneæ. Phyllanthus diffusus, *Kl. MSS.*; order Euphorbiaceæ.

Crotalaria Guatemalensis, *Benth. MSS.*, Tephrosia nitens, *Benth. MSS.*, Stenolobium brachycarpum, *Benth.*, Lonchocarpus velutinus, *Benth. MSS.*, Platymischium polystachium, *Benth. MSS.*, Ormosia Panamensis, *Benth. MSS.*, Bauhinia parvifolia, *Seem.*, Calliandra Seemanni, *Benth. MSS.*, Inga Darienensis, *Seem.*, I. Panamensis, *Seem.*, I. Œrstediana, *Benth. MSS.*; order Leguminosæ.

Licania arborea, *Seem.*; order Chrysobalaneæ.

Lopezia paniculata, *Seem.*; order Onagrarieæ.

We can only repeat the commendations we have already bestowed on this work. Its scientific interest is abundantly maintained in this third part.

Proceedings of Societies, &c.

The Phytologist Club.

One Hundred and Fifty-second Sitting.—Saturday, December 24, 1853.—Mr. Newman, President, in the chair.

The President read the following communications:—

New Irish Equisetum.

"I wish to call your attention to a very distinct variety, or species, of Equisetum, which I found two years ago. You may have probably

heard of it through your numerous correspondents, as one of the states of E. variegatum. It is, however, distinct from any British Equisetum I have seen. E. hyemale is the species it most resembles, and is nearest allied to, though very distinct from that plant, in its normal form at least, or, indeed, in any form that ever I have observed it assume. The *long*, *loose*, *white* sheaths, with *white setaceous teeth*, form good *primâ facie* marks to distinguish it from E. hyemale; besides, the stems are *longer*, *much more attenuated*, *and have fewer striæ*. The latter characters would appear to connect it with E. Mackaii, from which it differs, again, in a marked degree, in the colour of its sheaths, which have shorter teeth; and in its stems, which never branch. You will, nevertheless, be inclined to say the characteristic marks I have pointed out, and even the appearance of the specimens accompanying them, do not satisfy you that the plant is distinct from the species and varieties described in your last edition of 'British Ferns.' From such an opinion I would beg respectfully to dissent; and I will tell you why. It is different in *form*, *markings*, and, above all, *in constitution*. In this case, when language appears at fault, Nature steps in, and assists us to point out the diversity of her objects. The stems of all our British unbranched species of Equisetum are persistent, *remaining green throughout the winter*. The economy of the plant to which I am now directing your attention is the reverse of this: the *stems die down annually*. When I observed this last year, I supposed it might have been an accidental occurrence, and consequently resolved on waiting until I saw what would take place this autumn before I considered this a permanent character of the plant. The same result has been again obtained, and the original observation verified. The stems are now as yellow as ripe wheat-straw, lying flat on the ground, though those of *all* the other unbranched Equiseta are erect, and as green as rushes. Surely, then, this is sufficient to mark it as distinct. I herewith send you fresh specimens of E. hyemale, E. Mackaii, E. variegatum, var. *Wilsoni*, E. variegatum, and the new plant, which will enable you to judge for yourself."—*D. Moore; Glasnevin, December* 2, 1853.

The President exhibited a series of specimens of the beautiful plant mentioned in Mr. Moore's communication. He had referred to Vaucher's 'Monographie des Prêles,' in which unusual pains had been taken to distinguish the European Equiseta; and he found nothing resembling the plant on the table, to which he proposed to give the name of Equisetum Moorei, in honour of the distinguished botanist

who had discovered it, and who had for many years devoted the most assiduous attention to studying the Equiseta and ferns of Ireland. This was the third striking form of unbranched Equisetum which had been discovered in Ireland; and all of these had now received a name at his (the President's) hands: E. Mackaii, E. Wilsoni, and E. Moorei. He had once ventured on expressing an opinion that all the unbranched Equiseta were referrible to a single species; and he found that continental botanists were much inclined to adopt this view: but the question must eventually be decided, not by the dictum of any man, but by carefully ascertaining whether the characters supposed to distinguish them were constant or exceptional. *If constant, it mattered little how apparently insignificant; and if inconstant and exceptional, it mattered not how striking.* This principle was sound; it could never be antagonistic to Nature's laws. In the present instance, we had a plant apparently intermediate between hyemale and Mackaii, but differing in the possession of certain structural characters peculiar to itself. Now, this difference, seeing that the plant had hitherto been discovered in only one station (although not in very limited quantities), might be attributed to the effects of season, aspect, or soil; but then, the stems of the older species, hyemale and Mackaii, were persistent, while those of the new species were completely deciduous; and Mr. Moore found this difference to obtain equally when the plants were cultivated together, and the same conditions observed with all. He concluded by proposing the following characters, as sufficient to distinguish the new plant from those with which we were previously acquainted; and begged to express a hope that Irish botanists would endeavour, by diligent search, to extend the ascertained range of this interesting and strikingly beautiful species.

EQUISETUM MOOREI, *Newman.*

Rhizome not noticed.

Stems annual, completely *deciduous*, 20—30 inches in length, 3 or 4 united at base, perfectly erect, always unbranched, acuminate, gradually tapering throughout their length, with 12 (more or less) deep, well-marked striæ; the surface rough and hard to the touch; divided by transverse septa into 12 (more or less) internodes, the middle ones of which are longer than those of either extremity.

Sheaths loose, striated like the stem the interspaces between the striæ having a deep central sulcus, of a beautiful pearly white, with a black ring at the base, and black tips to the teeth; the

sheath of the spike black, spreading, campanulate, its teeth long, acuminate, aristate.

Teeth rigid, harsh, rounded or truncate at the apex, each having a median furrow on the back, the continuation of the intermediate furrows of the sheath; surmounted by loose, flaccid, membranous, silky, elongate, pointed awns, which are usually whitish, but occasionally black towards the apex of the stem; on the lower sheaths these awns appear evanescent, from their extreme fragility.

Spike sessile, black, composed of 35 (more or less) black, roundish scales, on which the striation of the stem is indistinctly continued; surmounted by a solid, conical, acuminate apex.

Hab. Clay-banks facing the sea at Rockfield, County Wicklow, Ireland; found by Mr. Moore, in company with Professor Melville, of Queen's College, Galway.

Herb. Moore, Newman, &c.

Mr. Luxford fully concurred in considering the beautiful plant on the table perfectly distinct from any described British Equisetum.

Enormous Plant of Osmunda regalis.

"In Merivale Wood, at the foot of Leith Hill, is a tump of Osmunda regalis, which appears to be but a single plant. It measures thirty-six feet in circumference, and has fronds at least eight feet long."—*William Bennett; Brockham Lodge.*

Asplenium lanceolatum.

"Towards the sea westward from Penzance, it entirely puts off its shrivelled Welch character. On the road near Sennen Cove, I have seen it form the entire covering of a wall most luxuriantly; and dug up a single root, from the bank at the foot of it, on which I counted eighty fronds."—*Id.*

Staffordshire Locality for Potamogeton flabellatus, Bab.

"To the localities already recorded for this pond-weed, may be added the river, and ditches which drain into it, at Stafford. The plant has been known to me, as a doubtful form, for several years. Although most abundant and luxuriant in growth, it flowers very sparingly. Its fruit I have not succeeded in obtaining. This year I was fortunate enough to meet with the broader and somewhat fugitive

leaves, so characteristic of the species. A specimen forwarded to Mr. Babington has been pronounced by him to be the plant which he has described and named as P. flabellatus."—*R. C. Douglas; Forebridge, Stafford, December*, 1853.

Lancashire Locality for Trifolium resupinatum.

"In the 'Phytologist' for December (Phytol. iv. 1143), I perceive Mr. J. G. Baker gives a Cheshire locality for Trifolium resupinatum. I found two small specimens of this trefoil on the Lancashire side of the Mersey, about the year 1849, at Everton. One of these I forwarded, this year, to Mr. Babington, who kindly named it for me; at the same time observing that it was most probably introduced among ballast. From this I beg to differ, as, from the locality, it would be almost impossible. The more probable means of introduction is, I think, among foreign hay, which is brought to this port in considerable quantity, and employed for feeding cattle during the winter. This may prove the means of introduction to many exotic plants. This year a botanical friend has found it growing in considerable quantity at Fairfield, a short distance from this town. I think that, both at the Cheshire locality and here, we cannot but consider it as introduced."—*H. S. Fisher; Scotland Road, Liverpool, December* 12, 1853.

Lathyrus Aphaca near Liverpool.

"I had the pleasure of finding a single specimen of the above plant at Bootle, about three miles from Liverpool, about two years since; but have been unable to obtain plants since, though I have searched for it diligently. This I believe to be the first and only time it has been found in this neighbourhood."—*Id.*

Gnaphalium rectum at Eastham.

"This season I obtained a plentiful supply of the rare Gnaphalium rectum from Eastham. Is this to be considered the G. sylvaticum, b. *norvegicum*, of the 'London Catalogue?' I enclose specimens of it."—*Id.*

Viola lutea at Netherton, near Liverpool.

"Viola lutea, a plant, I understand, formerly found in this neighbourhood, though many years ago, I had brought me, this season, from Netherton. The specimens were very luxuriant; some of them a foot in height."—*Id.*

Thymus Serpyllum and T. Chamædrys.

"Mr. Jorden's remarks on these plants fully agree with my observations, made this year. I gathered a few specimens of T. Chamædrys, for a friend, in October, when T. Serpyllum was, without exception, past flowering."—*Id.*

Polygala oxyptera on the Sand-hills near Liverpool.

"In the same locality, the sand-hills on this side the Mersey, I found several fine plants of Polygala oxyptera, fully agreeing with the description given by Mr. Babington in the 'Phytologist."—*Id.*

Rosa villosa, Viola imberbis, and V. palustris near Liverpool.

"Rosa villosa, not mentioned in our Liverpool Flora, I have found in two or three places in the direction of Walton. There, also, I find the variety of Viola odorata, Viola imberbis of Leighton; and, in a boggy piece of ground in the same direction, Viola palustris."—*Id.*

Hypnum nodiflorum, H. lycopodioides, and Bryum androgynum near Liverpool.

"The new, rare, and very pleasing addition to our British mosses, Hypnum nodiflorum, was found in June, this year, by Mr. Harrison, on the Crosby sand-hills. Here, also, in 1851, I found, for the first time, growing in great profusion, H. lycopodioides, but was not acquainted with its correct name until this year. The little thread-moss (*Bryum androgynum*) I found, last year and this, growing very plentifully in a sandy lane at Walton, commencing behind the church." —*Id.*

Filago spathulata in the Isle of Wight.

"I have quite lately been enabled to add Filago spathulata, *Presl*, to the Isle of Wight Flora. I first gathered it in a turnip-field near Kingston; and since that I have found it to be tolerably abundant in most of the sandy stubble-fields round Brixton and Lemerston."—*A. G. More; Brixton, Isle of Wight, November* 21, 1853.

Botanical Society of Edinburgh.

Thursday, November 10, 1853.—*Eighteenth Session.*—Professor Balfour, President, in the chair.

Dr. Balfour, in taking the chair, alluded to the value of the Society as a means of keeping up a friendly intercourse among those who were prosecuting the science of Botany. He alluded to the recent researches in regard to the class of plants called Diatomaceæ, which were now exciting the attention of botanists everywhere, more especially since the publication of Mr. Smith's work; stated that a large microscopical collection had been made at the Botanic Garden, and that the specimens would be exhibited during the session; and concluded by urging the young members to communicate their observations, and by pointing out the importance of carefully examining even the commonest plants which they meet with in their walks. He announced several papers to be read during the session.

A new part (concluding volume iv.) of the Society's 'Transactions' was placed on the table, containing papers by Professor Balfour, Mr. Babington, Professor M'Cosh, Dr. Greville, Major Madden, Dr. Wilson, Dr. Macadam, and Dr. Macgowan. The Secretary stated that the price of the part had been fixed at 4*s*.

Donations to the Society's library and herbarium were announced, from the Smithsonian Institution, Washington; the Cherbourg Natural-History Society; the Natural-History Society of Switzerland; Mr. Moore, of Chelsea; Dr. Beilschmied; M. Auguste Le Jolis; Mr. Edwin Lees; Mr. Thomas, of Bristol; Dr. Philip Maclagan; Lieut. Robert Maclagan; Professor Blytt, of Christiana; Mr. G. R. Tate; Mr. A. G. More; Mr. John Sibbald; Mr. W. M. Ogilvie, of Dundee; Mr. A. H. Balfour; Mr. John Smith, of Moffat; Messrs. Veitch & Son, of Exeter; Mr. Thomas Hay, of Prospect Bank, Leith; Mr. George Patton; Mr. George Wemyss Morison; the Rev. Dr. Mitchell, of Whitburn; Mr. James Hunter, of Hafton; Mr. Baxter, of Riccarton; Mr. Thomas Cannan; Mr. Dumbreck; Professor Christison; Dr. Lindsay; Mr. W. H. Macfarlane; and the Boston Natural-History Society.

Gamboge Plant.

Dr. Balfour stated that a fine specimen of the gamboge-plant had been sent to the Botanic Garden by Dr. Christison. The specimen was about two feet in height, and had been sent by Mr. Robert Little, Surgeon, from Kampoot, the leading seaport town of Cambodia, in Siam.

Diatomaceous Loricæ of the Mull Deposit.

Dr. Balfour read a note from Professor Gregory, in which he stated that he had continued the examination of the Mull deposit of Diato-

maceous loricæ, which he described, last winter, as containing 60 species of Diatoms; and that he had now found in it upwards of 140 species, which beats all the richest deposits known. Even at 60 it was far the richest. Besides the new species doubtfully indicated in his former paper, which Smith had named Eunotia incisa, he had found another and a very beautiful species, new not only to him, but to all those who had yet seen it or a figure of it. It is a Pinnularia, which, provisionally, he had named P. hebridensis. It is but scarce in the deposit, a large and populous slide rarely yielding more than one specimen, and often none at all; and as yet he has not been able to find a trace of it in any other deposit within his reach; nor is there anything like it in any work he had seen. As to Eunotia incisa, it occurs in a deposit from Lapland, in that from Lunebeg, and in one from the banks of the Spey; and it seems remarkable that it has been so long overlooked. P. hebridensis is small, its length from .00125 to .0026 inch, and it has, like P. lata, P. alpina, and P. distans, only 9 or 10 costæ in .001 inch; but all these are three or four times larger, and all on the side view are widest in the middle, whereas P. hebridensis is slightly contracted there; but it has the general characters of these three species, from the fewness and thickness of the costæ.

The following papers were read:—

Botanical Trip to the Grampian Mountains.

'Botanical Trip to the Grampian Mountains, in August, 1853;' by Professor Balfour.

In this trip Dr. Balfour was accompanied by Messrs. Gilchrist, Barclay, Jenner, Lawson, Mustapha, Katib, Soubki, Alex. Cowan, Charles Cowan, Cunningham, Young, Wood, Ross, Ogilvie, Cropper, and Bayley. He gave a general account of the Clova and Glen Isla district which was visited, and noticed the rare alpine plants gathered. He offered some observations on the remarkably limited distribution of Oxytropis campestris and Lychnis alpina, which were confined, the former to a single rocky projection in Glen Fiadh, and the latter to a small mountain summit called Little Gilrannoch. These plants only spread to a small extent from a centre. Besides the usual alpine plants, the party gathered a profusion of Polypodium alpestre, in various states. In Glen Fiadh the plant was small, and very little of it was in fructification. It this state it is difficult to distinguish it at first sight from Athyrium Filix-fœmina. In Glen Dole the plant was also seen abundantly, but in most parts sparingly in fructification. At the upper part of the glen, near the falls of the White Water, and

at the station where Mulgedium alpinum was originally found by Don, there were fine specimens of the Polypodium, two or more feet high, abundantly covered with sori. The same thing occurred a little above the track called Jock's Road. In these localities the fern was associated with fine specimens of Athyrium Filix-fœmina. The party looked in vain for specimens of Carex Grahami in the old station in Glen Fiadh; and they failed in seeing Potentilla tridentata on the rocks near Loch Brandy, which is the station given for it by Don. Dr. Balfour noticed the heights at which the alpine species occurred, and exhibited a plan of the alpine district of Scotland, with specimens of the plants arranged upon it at their different altitudes.

Dr. Balfour stated that, through the kind permission of Colonel Ogilvie, the party had the use of the large hall at Clova; and that Lord Castlereagh offered every facility for visiting Caenlochan Glen.

Vegetable Substance formed in a Water-pipe.

'Note on a Vegetable Substance formed in a Water-pipe, at Hafton, Argyleshire;' by James Hunter, Esq.

"About twelve months ago, having occasion to bring in an additional supply of water for the use of Hafton House, I had formed a small reservoir, or fountain-head, as it is called, from which to lead the water to the then only existing fountain-head, so as to increase the supply in the latter. The connexion between the two was by means of a burnt clay pipe, two inches in diameter, and in length thirty-six inches, securely fastened at the joinings with Roman cement, or mastic; the total length of the piping being three hundred and twenty yards, secured at each end by zinc roses, four inches in diameter, in order to prevent any impurities passing through the pipe. When the work was finished, the supply of water was very good; and it continued so until a fortnight ago, when the running of the water through the tile piping gradually diminished, and at last almost entirely ceased; a mere driblet, indeed, finding its way into the old fountain-head. Upon examination as to the cause of this change, by raising a considerable portion of the piping, there was found, about half-way between the two fountain-heads, the vegetable substance herewith sent. It was firmly lodged in one length of the piping, and projected an inch or so into another.

"It is very curious to observe that the colour of the water pressed out of this substance, when first taken out of the pipe, and saturated, as it was, was deep brown; whereas the water itself flowing through the pipe to the very last was as pure as crystal."

Part 2 of Dr. Lauder Lindsay's paper, intituled 'Tour on the Hartz Mountains,' was also read. (No report given).

Several new members were proposed; and the Society then adjourned till the second Thursday of December.

December 8, 1853.—Professor Balfour, President, in the chair.

Office-bearers were elected for the ensuing year:—President: Professor Balfour. Vice-Presidents: Professor Fleming, Dr. Seller, Hy. Paul, Esq., and James Cunningham, Esq. Council: Charles Jenner, Esq., John M'Laren, Esq., James M'Nab, Esq., Dr. Lindsay, Dr. Matthews, Dr. Priestley, Dr. Lowe, Professor Blackie, William Ivory, Esq., and G. R. Tate, Esq. Honorary Secretary: Dr. Greville. Foreign Secretary: Dr. Douglas Maclagan. Auditor: William Brand, Esq. Treasurer: W. W. Evans, Esq. Curator of Museum: Dr. Anderson. Assistant Secretary and Curator: Mr. G. Lawson.

Donations to the Society's library and herbarium were announced, from Miss Bromfield; the Berwickshire Naturalists' Club; Dr. Hoffmann, of Giessen; Dr. Cleghorn, of Madras; Mr. Polwhele, of Cambridge; Mr. Addison, of Gosford; Mrs. J. Drummond; Michael Connal, Esq., of Glasgow; Mr. D. P. Maclagan; Mr. Oliver, of Newcastle.

The following papers were read:—

Botanical Trip to Helvellyn.

'Notice of a Botanical Trip to Helvellyn, with pupils, in July, 1853;' by Professor Balfour.

Dr. Balfour stated that he was induced to bring this trip under the notice of the Society, in order to show what might be done, in the way of botanizing, in a short period. The party, consisting of 45, left Edinburgh at noon, on the 21st of July, by the Caledonian Railway, for the Lake district of England. Reaching Carlisle soon after 4 p.m., they proceeded to Kendal, where they were met by Mr. Wakefield. On the way to Ambleside they gathered an abundance of Stachys Betonica, Sanguisorba officinalis and Lactuca muralis, the last of which does not occur in the Scotch Flora, while the others are rare. The time was too limited to allow of a full examination of the shores of Windermere; and darkness came on ere the party reached their inn at Ambleside. Next morning (the 22nd) some of the party were up at half-past four, eager to commence their rambles. They proceeded to Stockgill Force, and in the neighbourhood of that cele-

brated waterfall gathered a number of rare plants, including Impatiens Noli-me-tangere, Festuca sylvatica, and Hymenophyllum Wilsoni, besides some more common plants, as Campanula latifolia, Polypodium Phegopteris, P. Dryopteris, and Scolopendrium vulgare. After breakfast thirty-nine of the party started for Rydal; while six remained to examine the country near Ambleside, with the view of afterwards going to Patterdale by coach. The walking party, on the way to Rydal, gathered a number of species by the waysides, which are probably escapes from the garden, although now naturalized on the tops of walls and other situations. Among them may be mentioned Sedum album, S. reflexum, S. Telephium, Sempervivum tectorum, and Mecanopsis cambrica. They also picked Tilia parvifolia in fine flower. On the banks of the Rydal Water, and the grounds in the vicinity, the following plants were seen :—Quercus sessiliflora, Carpinus Betulus, Lastrea Oreopteris, and a variety of L. Filix-mas with singularly contorted fronds. In Rydal Lake the party gathered Nymphæa alba, Nuphar lutea, Lobelia Dortmanna, Myriophyllum spicatum, Potamogeton natans and P. oblongus; and on its banks, Carex vesicaria, C. dioica, Lythrum Salicaria, Rhynchospora alba, Hypericum Androsæmum, and Berberis vulgaris. On the neighbouring roadside, Staphylea pinnata, Drosera rotundifolia, Anagallis tenella, Parnassia palustris, and Narthecium ossifragum were seen; and on the hilly grounds near Grassmere, Jasione montana, Allosorus crispus, which may be called the predominant fern of the district, and Sedum anglicum. Between Grassmere and Dunmail Raise, Saxifraga umbrosa was obtained; and near Wythburn, Solanum Dulcamara. The party then proceeded to ascend Helvellyn, which rises upwards of 3000 feet. In the ascent they gathered Saxifraga aizoides, S. stellaris, S. hypnoides, Lycopodium clavatum, L. selaginoides, L. alpinum, L. Selago, Alchemilla alpina, and Oxyria reniformis. The party reached the top in a thick mist, cold and wet. They waited patiently for a time, in the hope that some favourable change might take place; but, seeing no prospect of this, they proceeded to Swirrel Edge, with the view of descending to the rocks below. They had not, however, proceeded far down when the mist suddenly began to clear off, and the beautiful scenery around became visible. As the clearance continued to progress, there was a loud cry, "To the summit! to the summit!" Accordingly, they willingly retraced their steps. On reaching the top, they were gratified by one of the most splendid scenes they had ever witnessed: the thick mist gradually rose, and ever and anon displayed some interesting spot, some peaked or

rounded summit, some lake or estuary; until at length the whole curtain rose, the sun shone in all its brilliancy, and the entire Lake district was illuminated. It is not easy to describe the ecstasy of the party as scene after scene opened up to their delighted eyes; and when the whole mountainous district was discerned by them, their enthusiasm rose to the highest pitch. Scawfell, Bowfell, Honister Crag, Borrowdale, Skiddaw, Saddleback, Windermere, Coniston, Esthwaite, Morecambe Bay and its islands, the Solway, and the hills of Northumberland were all distinctly seen. It was truly a splendid sight, and they felt well rewarded for their toilsome and wet ascent. Proceeding to examine the cliffs below the summit, between Swirrel Edge and Striding Edge, they spent a considerable time in gathering the alpine productions of that locality, among which were Saxifraga aizoides, S. stellaris, S. nivalis (gathered by Mr. C. Cowan), S. oppositifolia, S. hypnoides, Oxyria reniformis, Poa alpina, P. vivipara, Festuca vivipara, Alchemilla alpina, Juncus triglumis, Carex rigida (which was also seen on the summit), Thalictrum alpinum, Hieracium alpinum, H. Lawsoni (picked by Mr. Soubki), Cerastium alpinum, Vaccinium Vitis-Idæa, Rubus saxatilis, Polygonum viviparum, Splachnum mnioides, Polytrichum alpinum; also Cochlearia officinalis, Viola sylvatica, Alsine verna (Mr. Bizzett), Sedum Rhodiola, Solidago Virgaurea, Veronica serpyllifolia, var. *humifusa*, Armeria maritima, Salix herbacea, and Juniperus nana. On the 22nd, after breakfast, the party proceeded by the shores of Ullswater to Gowbarrow Park, visited the waterfall, and then walked to Pooley Bridge. The following plants were gathered:—Nymphæa alba, Hieracium boreale, H. prenanthoides, Senecio aquaticus, Hypericum maculatum, H. perforatum, H. hirsutum, H. humifusum, Jasione montana, Stachys Betonica, Aquilegia vulgaris, Prunus Padus, Ligustrum vulgare, Sanguisorba officinalis, Holcus mollis, Calamintha Clinopodium, Lactuca muralis, Spiræa salicifolia, Circæa Lutetiana, Serratula tinctoria, near Pooley Bridge; Quercus pedunculata and Q. sessiliflora, at Gowbarrow; Genista tinctoria, Galium boreale and G. Mollugo, near Pooley Bridge; Mentha rotundifolia, at the same place; Thalictrum saxatile, Geranium phæum, G. nodosum, and Papaver somniferum, near a cottage. The best plants were gathered between two and three miles of Pooley Bridge. After passing the bridge, Plantago media was gathered abundantly on the roadside. The party walked to Penrith by the Round Table and Brougham Hall, gathering Potentilla reptans, Malva moschata, Galium Mollugo, and Plantago media. At Penrith Castle they picked Diplotaxis tenuifolia, and, leaving by

express at 3.20, reached Edinburgh at a quarter-past seven in the evening.

Plants growing about Dollar.

'Notice of Plants found in the Neighbourhood of Dollar, in the Autumn of 1853;' by Dr. Balfour.

Dr. Balfour stated that, having spent some time at Dollar last autumn, he had taken the opportunity of noticing some of the plants which grow in its vicinity, and now recorded a few of the more important species. In making up the list of the Flora, he was assisted by Mr. Westwood, of the Dollar Academy, who is well acquainted with the Flora, and who gave him a list of the plants found in the earlier summer months. In the immediate vicinity of Dollar, there grows a rare and characteristic plant, Rumex alpinus. It occurs on the banks of the Dollar water, and by the roadside near the Rumbling Bridge and Muckart. Equisetum umbrosum abounds on the banks of the Devon, near Cauldron Linn; and is likewise found near Castle Campbell, on the Dollar water, where, also, occur Rubus saxatilis, twelve ferns (including Hymenophyllum Wilsoni and Cystopteris fragilis), Festuca sylvatica, Poa nemoralis, &c. On the Ochills the following plants occur:—Saxifraga stellaris, S. hypnoides, Juncus triglumis, Epilobium alpinum, E. alsinifolium, Sedum villosum, Hieracium prenanthoides, Lycopodium alpinum, L. Selago, L. selaginoides, and L. clavatum. Near the summit of Ben Cleugh, Gnaphalium supinum and Salix herbacea were found; and at the Cauldron Linn, Carex pendula and C. remota. The following were noticed by Mr. Westwood:—Arenaria rubra, near Dollar; Ornithopus perpusillus, at Castle Campbell; Paris quadrifolia, Blairhill woods; Trientalis europæa, Vicars Bridge and Ben Cleugh; Lathrea squamaria and Neottia Nidus-avis, Castle Campbell; Meum Athamanticum.

Part 3 of Dr. Lindsay's paper, intituled 'Notes of a Tour on the Hartz Mountains,' was read.

A paper by Dr. James B. Balfour, of Kilsyth, 'On the Physiological and Therapeutical Actions of Cannabis indica,' was also read.

The following gentlemen were elected Ordinary Fellows:—John Forrest Dewar, Esq., 52, Great King Street; Henry Marshall, Esq., Edinburgh.

The Phytological Club
(In connexion with the Pharmaceutical Society.)

November 7, 1853.—R. Bentley, Esq., President, in the chair.

Donations to the herbarium were announced; *viz.*, parcels of British plants from Messrs. Deane, Muskett, and Reynolds, of London; Mr. A. W. Bennett, of Brockham; Mr. Payne, of Bridgewater; Mr. Penney, of Swanage; Mr. O. Corder, of North Shields; Mr. Morgan, of Llandilo; Messrs. Baxter, Moss, Walker, Tovey, Houlton, Medley, and Gissing, of Worcester.

Mr. T. Baxter, of Worcester, sent an account of his discovery, in August last, of Anacharis Alsinastrum in the Valley of the Severn; which has already been recorded in the 'Phytologist' (iv. 1101).

Medical Property of Osmunda regalis.

R. T. Bywater, Esq., M.R.C.S., of Coniston, communicated a note upon the popular use of Osmunda regalis. In Westmoreland, and also the adjoining division of Lancashire known as Lancashire North of the Sands, the rhizomes of Osmunda regalis are in high popular esteem as a remedial agent. The plant is vulgarly known under the name of "bog onion." It is used in the following way, as an external application for bruises, sprains, &c.:—The rhizomes are beaten, and being covered with "cold spring water," allowed to macerate all night, the resulting thick starchy fluid is then used to bathe the affected parts.

Impatiens Noli-me-tangere at Ambleside.

Mr. Reynolds, in presenting specimens of Impatiens Noli-me-tangere from its well-known station at Ambleside, took occasion to allude to the doubts which have been thrown upon its claim to be considered native, both there and in other localities. Botanists who have given an opinion upon the Ambleside station for the plant, have usually done so in an uncertain manner, and probably have considered that the peculiar property of its seed-vessels required the exercise of such caution, in the absence of direct evidence proving its indigenous character. Such evidence, however, exists in the fact that the locality is recorded by Ray upwards of 160 years back. In his Synopsis (1690) it is thus mentioned:—the synonymes are given and afterwards it is said—"We observed it on the banks of Winandermere near Ambleside. By the cloth-mill in Saterthwaite parish, Lancashire, and in many places of Westmorland, Mr. Lawson," (p.

209.) This proves that the plant was at that period thoroughly established in the district.—*R. R.*

Linnean Society.

Anniversary Meeting, May 24, 1853.—Robert Brown, Esq., President, in the chair.

This day, the Anniversary of the birth of Linneus, and that appointed by the Charter for the Election of Council and Officers, the President opened the business of the Meeting, and the Secretary read notices of the following Members who had died since the last Anniversary.

John Marten Cripps, Esq., F.S.A.; Philip Derbishire, M.D.; the Rev. Edward Duke, M.A., F.S.A.; the Rev. Henry Hasted, M.A.; Charles Morgan Lemann, M.D.; Gideon Algernon Mantell, LL.D., F.R.S., F.G.S., F.S.A. &c.; Mr. Donald Munro; Jonathan Pereira, M.D., F.R.S.; James Francis Stephens, Esq.; Thomas Thomson, M.D., F.R.S. Lond. and Edinb.; Frederick Thomas Wintle, M.D.; the Baron Leopold von Buch; Achille Richard; Mr. William Gardiner.

The Secretary also announced that fifteen Fellows and two Foreign Members had been elected since the last Anniversary.

Election of Officers.

At the election which subsequently took place, Thomas Bell, Esq., was elected President; William Yarrell, Esq., was re-elected Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council in the room of others going out: Francis Boott, M.D.; William John Burchell, D.C.L.; William Spence, Esq.; Francis Walker, Esq., and Robert Wight, M.D.

Portrait of Linneus.

Among the presents announced was a portrait of Linneus, copied by Prof. Pasch from the original by Roslin, in the possession of the Royal Acadamy of Sciences at Stockholm, for Archbishop Troil, by him presented to Sir Joseph Banks, and now presented to the Society by Robert Brown, Esq., President; for which the special thanks of the Society were directed to be given.

Vote of thanks to the late President.

It was moved by Dr. Wallich, seconded by Dr. Boott, and unanimously resolved:—That the most grateful and cordial thanks of the Society be offered to Mr. Brown for the admirable manner in which, for more than three years, he has conducted the business of the Society as its President; together with the great and sincere regret of the Members that advancing years and the infirmities attending on them should have induced him to relinquish an office, in which it would have been their earnest desire long to have availed themselves of his invaluable services.

Motacilla alba.

Mr. Borrer, jun., F.L.S., exhibited specimens of a rare English bird, the continental white wagtail (*Motacilla alba*), killed at Lancing in Sussex, in April, 1853.

New British Ferns.

Mr. Newman, F.L.S., exhibited specimens of two species of ferns found in Scotland, and not hitherto noticed as belonging to the British Flora: one of which (the Polypodium rhæticum of the 'Flore Française,' but not of Linneus) he believes to be the Polypodium alpestre of Hoppe; the other he considers to be new, and proposed to call it P. flexile. (See Phytol. 974).

Correction of a previous error.

I am indebted to my friend Mr. Doubleday for pointing out a clerical error in the notice of Mr. Moore's Handbook, at line 9 of page 1158 of last number: the word "uliginosa" should have been written "glandulosa." This correction is important to the right understanding of the notice in question.

Edward Newman.

On Salix acutifolia, Willd.; *and its Discovery in Britain.*

By John G. Baker, Esq.

Amongst an extensive series of willows collected in different parts of Cleveland, by Wm. Mudd, of Ayton, during the past season, and sent to me for examination a few weeks ago, were specimens of a plant differing widely in character from any species previously recorded as an inhabitant of Britain. There was no difficulty in deciding that it belonged to the Pruinosæ, a group which has been supposed to be without any representative in our indigenous Flora. So that, upon further investigating the subject, through the medium of my valued correspondent, I was much pleased to elicit the fact, that the plant in question grows wild (though at present confined to a single tree or bush in each station) in three localities in Cleveland; and that it is sufficiently well known to the inhabitants of the district, to be distinguished by them under the name of "black sallow."

Perhaps, when it is sought for more specially, it may be found elsewhere in greater abundance. But, though at present only known to occur so sparingly, the character and position of its localities, far away from the vicinity of any cultivated willows or osier-grounds, would seem to prevent the supposition, which might otherwise be entertained, of its having been introduced by artificial agency. The river Leven is formed by the union of two branches, which unite near the town of Stokesley. Of these, the southern and larger takes its rise beneath the culminating points of the oolitic moorlands which fill up the more considerable part of the North-east of Yorkshire, and flows towards the North-west. The northern branch is smaller in size, and of lesser elevation. It commences below Codhill Bog, near Roseberry Topping, the station for Cyperus fuscus and Carex Persoonii; and flows down Kildale, amongst woods which produce Cypripedium Calceolus, past the villages of Eastby and Ayton. From the neighbourhood of Roseberry Topping, along the slope of Ayton Moor, to the western extremity of Kildale, extends Airyholme Wood, a favourite locality for lichens, on rocks and trees. Through the centre of the wood, almost parallel with the Kildale branch of the Leven, flows a small tributary stream. Amongst the underwood along its margin, not far from where it leaves the wood, occurs the first bush of the willow, at an elevation above the sea of about 700 feet. The second grows on the bank of the main stream, about half a mile *above*

its junction with the Airyholme branch, in company with S. alba and other species. The third station is on the bank of the same stream, considerably nearer the village of Great Ayton, and has been noted for the last thirty or forty years as producing the "black sallow." Previously to 1840, three well-grown trees were in existence in this locality; but about that date they were each cut down to the ground, by a resident labourer, who was, doubtless, unaware of the damage he was committing. But, fortunately, from the remains of one of them a sucker sprung up, which has by this time grown into a tall bush, which flowers periodically; so that the station was not entirely destroyed. From this alone, a staminate plant, have flowering specimens been procured.

Almost all diversified and intricate genera appear to subdivide themselves into groups or sections, each composed of species more intimately allied to each other than to the members of any other group, which, as it were, radiate from primary or typical species as from a centre. Being natural in their character, these may usually be understood without difficulty; and when once appreciated they are of infinite assistance in gaining a correct idea of species. But, when the species possess a wide range of variation, it is almost impossible to decide with certainty how many each group contains; or whether a series of forms comprises a group of species, or a single species only. This is eminently the case with the genus Salix. The group to which the Cleveland willow belongs (Pruinosæ, *Koch*) may easily be distinguished. The plants which it comprises are characterized by sessile lateral catkins, the scales of which are discoloured at the tip, by yellow anthers, by the pale yellowish hue of their inner bark in the summer and autumn, and by the glaucous bloom which usually covers their branches, especially in a dried state. They are trees, or tall shrubs, with long, wand-like glabrous or hairy branches; lanceolate-acuminate, glanduloso-serrate leaves, usually downy when young, but invariably glabrous and indurated when fully matured; narrow female catkins, with subsessile ovaries, elongate styles, and linear-oblong stigmas; and broad, blunt male aments, the flowers of which each possess two free filaments. By Koch this group is placed third in order, between the Amygdalinæ and Purpureæ. In the arrangement of Fries it composes, with S. lanata, S. Lapponum, and other species which do not inhabit Britain, the second section of his subgenus Vetrix, which also includes the Viminales with S. acuminata and S. holosericea, *Willd.* In the Willdenovian 'Species Plan-

tarum' four species are enumerated. Koch reduces the number to two, which he thus designates and defines :—

"*S. acutifolia* (Willd. Sp. iv. p. 688.) — Aments sessile, minutely bracteated, capsules ovate-conic glabrous sessile, gland protruding beyond the base of the ovary, styles elongate, stigmas linear-oblong, leaves linear-lanceolate elongate-acuminate, like the young branches glabrous, *stipules lanceolate-acuminate.* River-banks. March. S. violacea, *Smith* in Rees' Cyclop. p. 38 (not Willd.) Bark of the branches dark red, covered with a dense and cæsious bloom."—*Koch, Synop. Fl. Germ.* p. 645.

"*S. daphnoides* (Vill. Dauph. iii. 765.) — Aments sessile, minutely bracteated, capsules ovate-conic glabrous sessile, gland protruding beyond the base of the ovary, styles elongate, stigmas oblong, leaves oblong-lanceolate acuminate glanduloso-serrate glabrous, when young villose like the young branches, *stipules semicordate.* In subalpine valleys descending into the plains with the rivers and in the marshes of Northern Germany. March, April. It varies with the branches covered with cæsious bloom and destitute of it; with the young branches subglabrous and very hairy; with the female catkins densely villose, the hairs equalling the stigmas, and less villose with shorter hairs; and with the leaves broader or narrower. S. præcox, *Hoppe* in Sturm. D. fl. i. 25. *Willd.* Sp. Pl. iv. p. 670, is the ordinary form with glabrous branches. S. cinerea, *Willd.* Sp. Pl. 460, after Link. H. Berol. ii. p. 414, is the variety with hairy branches. S. pomeranica, *Willd.* Suppl. p. 60, is a variety with narrower leaves and thinner aments."—*Koch, Synop. Fl. Germ.* p. 646.

Fries, in his latest work (Sum. Veg. Scand. vol. i. p. 56), marks these two species as doubtfully distinct, and does not regard true S. acutifolia as indigenous within his limits; but he considers that the Scandinavian daphnoides (Herb. Norm. vi. 51) somewhat approaches it in character. Ledebour (Fl. Altaica, vol. iv. p. 260) mentions that Livonian examples of S. præcox, *Hoppe*, have lanceolate stipules; and that specimens of S. acutifolia collected on Mount Ararat agree with the European præcox in the form of their leaves. But Koch (Syn. Fl. Germ. l. c.) says of S. acutifolia :—"It very much resembles the following species (S. daphnoides), yet differs in its mode of growth and the form of its leaves, and in my opinion it is truly distinct." In this view of the case Mr. Borrer, who has studied both under cultivation, concurs; and he adds that S. daphnoides is a more handsome shrub than S. acutifolia, and flowers more freely.

Before I received the willow from Cleveland, my herbarium con-

tained examples of S. daphnoides, named upon good authority, both from Germany and Scandinavia; but I was unacquainted with S. acutifolia, except by descriptions. At first, from its somewhat hairy young leaves (the leaves and stipules being scarcely narrower than those of the Scandinavian daphnoides), I supposed that the Cleveland plant might belong to a narrow-leaved form of that species. But upon sending it to Mr. Borrer and the Rev. J. E. Leefe, they both decided that it was S. acutifolia; the former kindly favouring me with a specimen showing that the young leaves of that species are also somewhat hairy; and the latter taking the pains to ascertain its identity with authenticated examples from Professor Koch.

So that with a description of Salix acutifolia, as it occurs in Britain, I will conclude.

S. acutifolia, Willd.—A tall bush, or shrub, moderately branched; inner bark lemon-coloured in the latter half of the year; branches long and wand-like, glossy, glabrous, dark purple, covered with a loose, easily disturbed coating of cæsious bloom, especially when pressed; stipules large, persistent, lanceolate-acuminate, glanduloso-serrate; petioles glandular like those of the Pentandræ; leaf-buds somewhat downy and villose; leaves elongate-lanceolate, much acuminated, dark green above, lighter and somewhat glaucous beneath, rigid in texture, very brittle when dry, prominently veined, moderately glanduloso-crenate-serrate. Female flowers unknown. Male catkins lateral, subsessile, bracteated at the base, sparingly produced, oblong, rounded at the apex; scales shaggy; filaments two, free; anthers yellow when matured, afterwards gray. Amongst British willows, most resembling the Purpureæ in its habit of growth; the Fragiles, in the shape and serrature of its leaves; and Salix Lapponum (S. arenaria, *Auct. Brit.*) or S. lanata, in its female flowers; but very unlikely to be mistaken for, or confounded with, any of them.

John G. Baker.

Market Place, Thirsk,
December 12, 1853.

Contributions towards a History of an Irish Asplenium, considered as a distinct Species, and as entitled to a place in the British Flora. By Edward Newman.

It is not presumed that the history of this beautiful fern can be worked out from the materials here collected. Their tendency will,

however, be sufficiently suggestive to induce pteridologists to examine the question, for their own satisfaction; and I need scarcely say how

Asplenium acutum (?). Natural size of a small frond gathered on Turk Mountain, by Dr. Allchin.

much obliged I shall feel for any evidence on the subject, be its tendency what it may.

I have arranged my extracts, &c., under four heads, which I have called Geographical, Bibliographical, Botanical, and Cultural; introducing scarcely any new matter, but objecting to statements which I believe erroneous, and to conclusions which are not in accordance with the premises.

Geographical.

Asplenium acutum occurs in the Azores (v. s.), Madeira (v. s.), and the Canary Islands (Willdenow, Sprengel), Portugal (Wellwitsch), Spain (Willdenow, Sprengel), Italy (Sprengel), Illyria (Sprengel), Istria, Croatia, Sclavonia, and Hungary (Sadler), and Ireland (Mackay, v. s.; Andrews, v. s.; Allman, v. s.; Allchin, v. s.) In those instances where the v. s. is attached, I have examined the specimens, and entertain no doubt as to their belonging to a single species. With the exception of size, there is no disparity amongst them: the Atlantic specimens are *generally* larger than the European or Irish.

Bibliographical.

a. Extracts from authors who unhesitatingly treat the species as distinct from Adiantum nigrum:—

1. Ray.

Filix minor longifolia, tarsis raris, pinnulis longis, tenuissimis et oblongis laciniis fimbriatis D. Sherard. Syn. ii. 51. 12 non ramosa tenerior, pinnulis vere capillaceis, seu Filicis genus ex Hibernia molliusculum, foliis tenuissime pennatis. Pluk. Alm. 150. Mant. 78. T. 282. f. 3. On the Mountains of Mourn, in the County of Down, in Ireland.—*Synopsis*, 3rd edit. p. 127, date 1724.

2. Willdenow.

96 Asplenium Adiantum-nigrum.

> Frons plerumque bipinnata, quandoque inferne tri- et superne bipinnata. A sequente tamen satis diversum: pinnis nunquam caudatis, id est longissime acuminatis, pinnulis non acuminato dentatis, et fronde nunquam ex toto triplicato pinnata.—*Sp. Pl.* v. 347.

97 Asplenium acutum.

A. frondibus triplicato-pinnatis, pinnis oblongo-lanceolatis longissime acuminatis, pinnulis pinnatifido-incisis, laciniis apice acute subbidentatis, soris demum confluentibus. W.

Asplenium acutum. Bory in Litt.
Asplenium Adiantum-nigrum. Bory ess. sur les isles fortun. 313.
Spitziger Streifenfarrn. W.
Habitat in rupibus Teneriffæ, inque Hispania 4 (v. s.)
Duplo majus præcedente et ex toto triplicato-pinnatum. Apex pinnarum longissime acuminatus W. — *Species Plantarum*, v. 347, date 1810.

3. Sadler.

Asplenium acutum. Bory.

Radix et stipites Aspl. Ad. nigri: radix quippe dense fibrosa fuscescens. Stipites ex una radice plures primum cum rhachide virides, demum profunde purpurascenti-fuscescentes, nitidi, supra sulcati. Frons—siccatione facillime nigrescens—½—1 pedalis, acutissime acuminata, inferius perfecte tripinnata, pinnis propriis acute incisis, in medio bipinnata, in apice rhachis longe producta, solum acute dentato-incisa est, quod idem de rhachidibus propriis pinnarum oblongo-lanceolatarum longe v. longissime productarum valet. Laciniæ omnes lanceolatæ, acutæ, acutissimæ et profunde inciso-dentatæ. Sori breves, solitarii in laciniis, has demum obtegentes. Indusia membranacea.—*Adumbratio Epiphyllospermarum Hungariæ*, &c., p. 28, date 1820.

4. Sprengel.

143 Asplenium acutum, *Bory*. *W.*

A. foliis oblongo-lanceolatis acuminatis, foliolis inciso-dentatis, dentibus subbidenticulatis. *Illyria*. *Italia sup.* *Hispania*. *Teneriffa*.—*Systema Vegetabilium*, iv. (pars 1) 90, date 1827.

5. Szadler.

Asplenium acutum.—*Szadler A'Magyar Plantak szaritott gyujtemenye*, fasc. xi. No. 9, date ——. (The fasciculi of this work range from 1823—30. I do not know the date of fasc. xi.)

6. Sadler.

11 Asplenium acutum, Bory.

Fronde ovato-triangulari longe acuminata, pinnis pinnulisque

oblongo-laceolatis longe acuminatis, pinnis propriis et laciniis lanceolatis, approximatis, acute et profunde inciso-dentatis; dentibus subbidenticulatis.

Fructificat Jul. Aug.

Specimina a nobis et aliis in Hungaria lecta omnino cum illis conveniunt quæ in herbariis diversis Viennensibus intueri licuit et quæ cl. Kaulfusz in Teneriffa lecta amice communicavit. Invenitur hæc planta quoque in herbario antiquo cel. Crantz nunc Universitatis Pesthanæ quin locus natalis notaretur.

Habitat in Croatia et Slavonia (ubi ? Kit. msc.), ad Thermas Herculis (Kit. et Rochel), in lauretis ad Flumen, in Breyda et Ponsal, tum in laureto ad Abbatiam in adscensu ad Montem majorem Istriæ, loco—per mare—Flumine hora saltem distante (ego).—*De Filicibus Veris Hungariæ*, p. 31, date 1830.

7. Presl.

Asplenium acutum, Bory.—*Tentamen Pteridographiæ*, p. 107, date 1836.

8. Wellwitsch.

Asplenium acutum, Bory.—*Wellwitschii Iter Lusitanicum In rupibus totæ Estramaduræ vulgare*, Nov. 1839.

b. Extracts from authors who have treated this fern as possibly or certainly a variety of Adiantum nigrum :—

1. Dillenius.

(In hac planta seminalia nulla observare contigit, unde an species vere distincta sit, dubium videtur. Forsitan non nisi varietas est, Adianti nigri officinarum J. B. loci umbrositati originem debens, nam in spelunca, quam radii solares nunquam illustrabant, nascebatur. Sane vero si varietas sit, singularis ea est et valde speciosa).—*Dillenius in Ray, Synopsis*, 3rd edit. p. 127, date 1724.

2. Sir J. E. Smith.

Asplenium Adiantum nigrum *β*.

Sherard's original specimen of the variety *β*, preserved in his herbarium at Oxford, is truly elegant, of a delicate membranous texture, the leaflets palmate finely laciniated. Plukenet's figure by no means does it justice. No fructification is discernable.—*Smith, Eng. Fl.* iv. 311, date 1828.

3. Mackay.

I found in 1805, on the limestone rocks at Mucruss, a beautiful and delicate variety of Adiantum-nigrum with fronds tripinnate throughout, or with pinnules deeply and finely laciniated. It was subsequently found by Miss Hutchins and Dr. Taylor, and Mr. W. Andrews lately gave me a specimen collected by him in 1835, on a mountain called Cahir Conree, six miles from Tralee.—*Flora Hibernica*, p. 342.

4. Francis.

Sir J. E. Smith, in conformity with the old authors, makes another variety, differing only from the common plant in having long fronds and distant pinnæ; but I leave any one to say if it be anything more than a drawn-up plant of the common species, found, as it was, solitary in a dark cave.—*Analysis*, p. 50, date 1842.

5. Dr. Allmann.

There may be some doubt as to the necessity of considering it separately from the common form of Adiantum-nigrum, for though the extreme forms are so remarkably distinct as to strike the most casual observer, yet these extremes are connected by such numerous gradations, by which they run into each other, that I believe it to be impossible to say where the common variety terminates and the rarer one commences: the great elegance, however, of *well-marked specimens* of the rarer variety, and the facility with which they may be distinguished from the common form, seems to render a separate notice of the fern desirable.—*British Ferns*, p. 260.

6. Newman.

Asplenium Adiantum-nigrum, var. acutum.—*British Ferns*, p. 259, date 1844.

7. Hooker & Arnott.

A variety of Asp. Adiantum-nigrum with linear pinnules is found by Mr. Wilson in Ireland, at Muckruss by Mr. Mackay.—*Brit. Flora*, p. 574.

8. Moore.

Asplenium Adiantum-nigrum γ. acutum; fronds tripinnate throughout; ultimate pinnules cut into linear sharply toothed segments. Asplenium Adiantum-nigrum var. acutum, Newm. 259. Asplenium acutum, Bory.—Asplenium Virgilii, Bory.—Tarachia acuta, Presl. * *

The most distinct is acutum, which is a remarkably elegant plant;—chiefly found in Ireland and in the western counties of England, and seems rare.—*Handbook of British Ferns*, p. 158, date 1853. [I mention this work simply from a feeling of courtesy, as it would not be right to pass over a notice in which my late friend Bory's authority and my own are cited. It must, however, be observed that the plant has not been recorded as growing in England, and that Mr. Moore's figure evidently represents the commoner species. I cannot, therefore, regard Mr. Moore as expressing any opinion on the specific identity of a fern with which he appears to be unacquainted.]

Botanical.

First.—It appears to me that Dillenius, Smith, and Francis exercise sound botanical discretion in refusing to establish a species on the faith of a single frond, and that barren, and grown in a dark cave. In these three facts we cannot fail to see strong reasons against such a course. But, while admitting the justice of the conclusions which these botanists draw from the very scanty materials within their reach, we must place greater confidence still in the conclusions which Bory, Willdenow, Sadler, Sprengel, Presl, and Wellwitsch have agreed in drawing, from materials the most perfect and complete that could be desired. Just in proportion as it was right to reject such scanty evidence, so would it be absolutely absurd to weigh the conclusions drawn from that single barren frond against those founded on copious series of mature, normal, and highly fructified fronds. It is worthy of especial observation, that Bory, Willdenow, and Sadler calmly and philosophically consider the hypothesis of uniting the two species, and, assisted by their abundant materials, unhesitatingly reject it. Sprengel, Presl, and Wellwitsch do not even entertain the question. The argument that the peculiarities of the fern are due to situation, or want of fruit, falls entirely to the ground when we learn that such conditions were purely exceptional. Dr. Allmann's opinion is, however, of great value, and is not liable to the objection of being formed on insufficient data. It is noticed again below.

Secondly.—The occurrence of the same plant in Teneriffe, Madeira, Portugal, Spain, Italy, Illyria, and Hungary,—countries in most of which Adiantum-nigrum occurs, and has never been confounded with it,—is a *primâ facie* argument in favour of its distinctness.

Thirdly.—In Ireland, also, it is additional to Adiantum-nigrum, instead of replacing it: Adiantum-nigrum is common; acutum, local, and noticeable as a comparative rarity.

Fourthly.—Although Dr. Allmann speaks of intermediate forms, and seems to regard the two species as passing into each other, by means of these; I may state that I have carefully searched herbaria for such intermediate specimens, but have never found them.

Fifthly.—If we take a series of acutum, arranged according to size, we shall find that certain of them are of the same magnitude as Adiantum-nigrum, while others are abundantly larger, and some are also smaller: but all equally differ from Adiantum-nigrum in the multiplicity and acuteness of their divisions; the smaller specimens being equally attenuate, divided, and acute with the larger. In Adiantum-nigrum, on the contrary, the smaller fronds are blunted, and less divided than the larger ones.

Cultural.

Dr. Mackay dissuaded me from giving Asplenium acutum as a species in the second edition of my 'British Ferns,' by stating that it was nothing more than a remarkably attenuated, divided, and elegant form of Adiantum-nigrum, and returned to the ordinary state under cultivation. I am far from convinced that the facts of the case were noticed with sufficient care. I rather incline to regard that eminent botanist as having been misled by the unintentional transposition of pots or labels. Certain it is that such a disposition to assume a new form, or, as it might be termed, to revert to a normal form, has not been observed by other cultivators; the tendency of cultivation being to develope and perfect those very characters of greater size, greater amount of subdivision, greater attenuation of parts, &c., which originally served to distinguish it from its congeners.

Since I undertook the investigation of this subject, I have obtained the valuable assistance of Mr. Watson and Mr. Babington; and this will probably lead to a second paper, in the March number of the 'Phytologist.'

Edward Newman.

9, Devonshire St., Bishopsgate,
January, 1854.

Notes on the 'Cybele Britannica,' Volume III.

By William Borrer, Esq., F.R.S., &c.

(These Notes were kindly given for my use by Mr. Borrer. And seeing that most of them have the valuable recommendation of being either additions to knowledge previously on record, or corrections of imperfect and erroneous records, I requested Mr. Borrer's permission to forward them to the 'Phytologist,' which he has allowed me to do. —*H. C. Watson.*)

Page.

10. *Potamogeton flabellatus.* Add to the enumeration of counties Warwick. Mr. Kirk found it at Coventry, and was the first to point out its difference from the true P. zosteraceus, *Fries.*

14. *Potamogeton zosterifolius.* I have never seen a Sussex specimen. It is by mistake, no doubt, that it is said to grow at Henfield.

18. *Potamogeton heterophyllus* and (p. 22) *P. plantagineus.* In the 'Phytologist' for 1852 (iv. 637) these two species are said to occur on the ridge of Tilgate Forest, about a mile South of Balcombe. Having never before heard of the former as a Sussex plant, and suspecting that the Sussex specimens that have been named P. plantagineus belonged, in fact, to P. oblongus; I applied to one of the writers of the memoir referred to for specimens of the plant, or directions to the spot producing them; but received no answer. I must, therefore, still hesitate to regard them as natives of the county.

84. *Eriophorum latifolium.* Whatever the E. polystachion of Dartmoor may be, this is a native of Devon. It grows in the deep valley on the right of the ascent of Haldon, in the way from Exeter to Chudleigh: *W. B.*

85. *Eriophorum gracile.* Mr. Woods's specimens, of which I possess one, prove his Yorkshire plant to be this species. Hagnaby, in the 'Manual,' is no doubt an error of the pen or of the press. The Sussex plant, as well as Don's from the Highlands of Scotland, has long since been ascertained to be a slender variety of E. angustifolium, *Roth*, E. polystachion, *Linn.*

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87. *Carex Davalliana.* A specimen given me by Mr. Forster enables me to vouch for the identity of the Lansdown plant with specimens from Switzerland, communicated by Smith himself.

98. *Carex elongata.* Kent, on the banks of the Medway, at Tunbridge; shown me by Mr. Jenner.

152. *Phalaris paradoxa.* Not extinct in August, 1851; but I saw but few plants of it.

161. *Alopecurus fulvus.* I saw it, last year, in the place near Chichester where Mr. Newbould discovered it; and Mr. Woods has observed it near Maresfield.

169. *Agrostis setacea.* When a young botanist, I mistook a variety of A. vulgaris for this species, which was hence reported as growing on wet commons in Sussex. One extensive patch, discovered by Mr. Woods and myself, on the forest, near Heathfield, is all that I have seen of the true plant in this county.

241. *Hordeum sylvaticum.* River Hill, near Sevenoaks, Kent: *W. B.*

279. *Asplenium lanceolatum* grows, or grew, in Kent as well as Sussex, in the vicinity of Tunbridge Wells.

307. *Equisetum hyemale.* I have specimens from South Kent, sent me by the Rev. G. E. Smith.

312. *Ranunculus confusus.* Somersetshire, Shirehampton; Hants, Hayling Island: *W. B.*

313. *Ranunculus tripartitus.* Shown me, in 1852, by Mr. W. W. Reeves, near Tunbridge Wells, on the Kentish side of the boundary of the counties, where he had observed it several years, but had never found capillary leaves. I have, however, the satisfaction of having such produced in plenty in my own garden, whither a plant was brought from Esher, in 1849.

374. *Ranunculus fluitans.* West Sussex: *W. B.*

315. *Fumaria micrantha, F. Vaillantii,* and *F. parviflora.* I have not seen a Sussex specimen of either of these; but there is good authority, Mr. Mitten's, for the first having been gathered near Lewes.

317. *Farsetia incana.* This species sprung up, about fifty years ago, at Lewes (as it is said to have done, somewhat earlier, at Weymouth), on ground broken up for building on. I knew

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it for a few years as a weed in the recently formed gardens; but I believe it has long since disappeared.

319. *Barbarea stricta.* Perhaps I too hastily set down this plant as growing in Northamptonshire, having only seen what I took for it in passing on the railway, in 1842, and not having been able to see it on several subsequent occasions. It is plentiful in several parts of Yorkshire. The form of B. vulgaris with spreading fruit, which has been called B. arcuata, is probably not uncommon. I find it in Sussex and Essex. B. vulgaris, var. *intermedia*, of Buxton, in the 'Manchester Botanical Guide,' which has been mistaken by some for B. stricta, is nearest to B. vulgaris, but presents some remarkable differences. I have not had the opportunity of cultivating it.

323. *Viola stagnina.* I cannot account for this plant in Mr. Leighton's garden, as from me. I am persuaded that I never had it until Mr. Babington sent it me, in 1851, from Bottisham Fen.

329. *Rubus suberectus.* Woods near Lindfield, and by Burton mill-pond near Petworth, both in Sussex: *W. B.*

333. *Trifolium strictum.* Downs, and balks of corn-land, in the Canton de la Moye, Jersey, 1851: *W. B.*

346. *Poterium muricatum.* Above the Culvers, Isle of Wight; Eartham, Sussex: *W. B.* At Eartham it forms part of the ancient turf, as I think it does also in one place either in Essex or in Cambridgeshire, shown me by Mr. Gibson. Near Betchworth, Surrey, near Saffron Walden, and in the Isle of Wight, it occupies fields that have been more or less recently under tillage.

347. *Pyrus pinnatifida.* According to the Ordnance Map, the station observed by Mr. Reeves is within the county of Hants. There are several plants, among abundance of P. Aria and P. aucuparia, between which I cannot but suspect it a hybrid. They are cut periodically as underwood.

349. *Epilobium lanceolatum* has been a weed in my garden for thirty years, at least; how introduced, I never knew. It has recently found its way to some neighbouring hedge-banks; and it will probably become permanently established. I have observed the species in Guernsey and Jersey.

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349. *Claytonia perfoliata*, Linn. In the 'Phytologist' for 1853 (iv. 982) are some remarks on the tendency of this plant to become naturalized. It comes up plentifully every year in my garden, and on a sandy bank adjoining, facing the South, but mostly shaded by bushes, to which it escaped previously to 1817. It is rather a startling assertion (Phytol. l. c.) that Baxter's figure in 'British Phænogamous Botany,' vol. iv. p. 253, of C. alsinoides is a remarkably good one of C. perfoliata! I have visited the Derbyshire locality from which Mr. Baxter's specimen came, and witnessed the accuracy of the account that he has published of the situation. It is a mile or more from the Chatsworth gardens, in which, moreover, I was assured that the plant was unknown until it was brought in from the wood.

349. *Sedum stellatum*, Linn., is still more decidedly naturalized than Claytonia perfoliata, on the same bank, and others in the neighbourhood, where it is found in myriads, either alive or dead, at all seasons. It is probable that these two plants will keep their ground when I and my garden shall be forgotten; and it were well, for the information of future botanists and Cybelists, that their escape, and other such-like facts, should be placed on some permanent record, whilst yet their accuracy can be ascertained.

353. *Sedum elegans*, Lej. The plant that I understand as intended by this name is S. rupestre, "*Linn.*" *Sm.* The Sedum said to be from Jersey has narrow, upright petals, almost white, and leaves as green as those of S. virens. I have another Sedum, believed to be from Devonshire, with petals equally narrow and upright, but of a pale yellow, and gray leaves, remarkably imbricated in rows. I suspect this to be S. anopetalum, *DeC.*, which Koch places among the yellow-flowered species.

376. *Helleborus viridis.* Truly native in woods and thickets in the vicinity of Petersfield, both in Hants and in Sussex, as well as in Yorkshire. Its stations in East Sussex (Woodmancote and Henfield) are unsatisfactory.

381. *Lepidium Draba.* Lake-Lancashire. A patch by the Ulverstone road, at Newby Bridge, 1853: *W. B.*

325. *Lychnis alpina.* I had the pleasure of visiting this plant in Hobcartin, last June (1853). It is indubitably a native there,

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on perpendicular walls of rock, mostly inaccessible. I could reach one root only.

401. *Geranium sylvaticum.* By Coniston Water: *W. B.* Although, my attention not having been called to it, I do not recollect it, I suspect it is frequent in that part of Lancashire, as it is in the valleys of the rest of the Lake district.

419. *Fragaria elatior.* Several years ago, the landlord of the High-Force Inn, Teesdale (Mr. Scott, I think), a person well acquainted with the plants of his district, showed me there a tall variety of F. vesca, not of rare occurrence elsewhere, as F. elatior of Baines's 'Yorkshire Flora.'

419. *Agrimonia odorata.* Start Point, Devon; near Gwithian, Cornwall, *Mr. Joseph Woods*, who has given me a specimen.

„ *Rosa hibernica.* Cumberland, decidedly native. Between Buttermere and Scale Hill, a single bush observed, 1845; hedges near Lorton, 1853: *W. B.*

431. *Polycarpon tetraphyllum.* I gathered this, a few years ago, on the Neck of Portland.

„ *Sedum turgidum*, DeC. I see reason to doubt the accuracy of my former idea of this plant, having received from the Kew garden a living specimen, so named, with much more turgid leaves, and more rounded petals, than the plant af our Sussex villages. This I am now inclined to regard as a rather enlarged form of S. micranthum, *Haw.*; still supposing it distinct from the Malvern S. album (Haworth's S. teretifolium).

466. *Menziesia cærulea.* I wrote "among the heath and crowberry" (*Empetrum nigrum*). The misprint is scarcely worth correcting, as it is very probable that the Scotch "cranberry" (*Vaccinium Vitis-Idæa*) grows there too, though I do not recollect it.

467. *Pyrola minor.* Mr. Reeves and another friend have sent me this from the neighbourhood of Canterbury.

478. *Thymus Serpyllum* and *T. Chamædrys.* Mr. Babington, in statements now before the public, recognizes both these plants as British. I have found both widely distributed, but am inclined to think T. Serpyllum the more general of the two.

482. *Galeopsis versicolor.* I must have omitted from inadvertence to mark this as a Sussex plant. I have met with it, however,

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only twice in the county, and in both places sparingly. Like Mr. Leighton, I find it coming the same from seed, and that during several years, in my garden; yet I have seen so many intermediate forms in Scotland, that I much suspect it not truly a distinct species from G. Tetrahit.

485. *Myosotis sylvatica.* Certainly a native of Hants. I have gathered it at Lyss, three or four miles from Petersfield. I have no knowledge of it as a Sussex plant.

490. *Cyclamen hederifolium.* Mr. Saunders kindly showed me the one large old root that he discovered. It was in a wild wood, where it was very unlikely to have escaped from any garden, or to have been placed by human agency; but it is now destroyed, by the construction of a reservoir to supply the town of Hastings with water.

501. *Polygonum maritimum* and *P. Raii.* I think the specimens that I have the pleasure of sending will prove the Hampshire plant to be true P. maritimum, whether P. Raii is truly distinct or not. I had, last year, P. maritimum from Sarnian seed, preserving its proper appearance, as do also seedlings from it this year, as far as can be judged in their present imperfect stage of growth. The last year's plants fruited the first season, and perished in the winter. I have P. Raii from Forfarshire, from W. Gardiner; and from Galloway, I am not certain from whom. I have gathered it myself in Cornwall, Devon, Somerset, Hants, Sussex, Merioneth, Lancashire (Fleetwood), and the Channel Islands.

512. *Habenaria bifolia* and *H. chlorantha.* I have seen both of these, this summer, among the Lakes.

„ *Habenaria albida.* I have seen it in plenty, in different years, in its one Sussex station.

Wm. Borrer.

Henfield, August 1, 1853.

Additional Notes (*Oct.* 1, 1853.)

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17. *Potamogeton longifolius.* Mr. T. Kirk found it, last month, in Ballinabrack River, Lough Corrib; and sent me recent fragments.

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17. *Agrimonia odorata.* I have now seen this plant in Mr. Woods's Devonshire station; and also at Balcombe, Sussex, where it was first observed by the Rev. W. H. Hawker.

276. *Asplenium viride.* In the deep cracks of an old brick wall at Mickleham, Surrey, where I was shown upwards of twenty plants, by a gardener of that neighbourhood, who discovered it a few months ago, and had taken away several roots. The occurrence of the one root at Danny (Hurst Pierpoint), Sussex, is not very adequately accounted for by the recorded fact, that Ray spent some months there in 1667—8. (See Phytol. iv. 842, 915, 947). Ceterach officinarum grows in several places in that part of Sussex. The statement that Polypodium Dryopteris has been found in the neighbourhood is, I fear, a mistake.

504. *Euphorbia stricta*, Koch. Woolmer Forest, Hants, on recently reclaimed corn-land, *Rev. W. H. Hawker*, who has shown me specimens.

Notices of New Books.

'*Species Filicum; being Descriptions of all known Ferns.* Illustrated with Plates. By Sir William Jackson Hooker, K.H., LL.D., F.R.A. & L.S., &c., &c., &c., Vice-President of the Linnean Society of London, and Director of the Royal Botanic Garden of Kew.' Part VI., or Vol. II. Part 2. London: William Pamplin, 45, Frith Street, Soho Square. 8vo. 64 pp. Letterpress; 20 Plates. Price 10*s.*

Having already expressed our opinion very fully on the delay in publishing this work, we abstain from any remarks on that head, and simply give the contents of the part before us; premising that the previous part concluded with Hypolepis tenuifolia, the first species of the genus.

Suborder IV. Pterideæ.

Genus III. (IV.?). Hypolepis, *Bernh.*

Sp. Guianensis, *Kl.;* dicksonioides (Cheilanthes dicksonioides, *Kze.*); amaurorachis (Ch. id., *Kze.*); setigera (Ch. id., *Blume*);

alpina (Ch. id. *Blume*); resinifera (Ch. id., *Blume*); polypodioides (Ch. id., *Blume*); pallida (Ch. id., *Blume*); repens, *Presl;* resistens, (Ch. id., *Blume*); parallelogramma (Ch. id., *Kze.*); nigrescens, *Hook.;* anthriscifolia, *Presl;* elata, *Presl;* aspera, *Presl;* Bergiana (Ch. id., *Schlecht.*); rugulosa (Pteris id., *La Bill.*); Millefolium, *Hook.;* hostilis, *Presl;* Purdieana, *Hook.*

Frond rather small, bipinnate.

Sp. distans (Ch. distans, *Col. MSS.*)

Fronds small, deltoid, very compound; segments very acute or cuspidate. Aspidotis, *Nutt.*

Sp. Schimperi (Ch. id., *Kunze*); Californica (Aspidotis id., *Nutt. MSS.*)

Adiantoidea.

Sp. Capensis (Ch. id., *Sw.*)

Fronds with tufted roots, no creeping caudex. Cheilanthoideæ.

Sp. radiata (Adiantum id., *Linn.*, *Sw.*, *Willd.*, &c.); pedata, *Hook.;* spectabilis, *Link*; perpaucula (Adiantum id., *Kze.*); Gardneri, *Hook.*

Genus IV. Cheilanthes, *Sw.*

"Adianti, Allosori, Pteridis, Cassebeeræ, Notholenæ, Hypolepidis sp. *auct.*"—P. 75.

"Vain is the attempt to form any definite character which shall decide the proper limits of this genus."—P. 75. So writes Sir William Hooker: then, we would ask, why not abandon it altogether?

Fronds simply pinnate.

Sp. micropteris, *Sw.*

Pinnæ or pinnules large for the Genus, broad; white and powdery beneath.

Sp. argentea, *Kze.;* farinosa, *Kaulf.;* pulveracea, *Pr.;* rufa, *Don.*

Pinnæ or pinnules large for the Genus, broad; not white or pulverulent nor scaly beneath.

Sp. Dalhousiæ, *Hook.;* pteroides, *Sw.*

Pinnæ or pinnules as in the preceding Group, but densely clothed with imbricated scales.

Sp. squamosa, *Gill.*

Fronds generally decompound, the pinnules small, glabrous or hairy or scaly. Eucheilanthes.

Sp. fragrans, *Webb et Bert.;* tenuifolia, *Sw.;* Preissiana, *Kze.;* Sieberi, *Kze.;* microphylla, *Sw.;* Tweediana, *Hook.;* Seemanni, *Hook.;* Moritziana, *Kze.;* elongata, *Willd. herb.;* obtusata, *Pr.;* crenata, *Kze.;* Wrightii, *Hook.;* subvillosa, *Hook.;* bullosa, *Kze.;* pygmæa, *Kl.;* varians (Pteris varians, *Wall.*); Alabamensis, *Kze.;* Moluccana, *Bl.;* Kleinhoffii, *Bl.;* multifida, *Sw.;* triangula, *Kze.;* Mathewsii, *Kze.;* hirta, *Sw.;* induta, *Kze.;* pubescens, *H. B. K.;* MacLeanii, *Hook.;* Mysurensis, *Wall.;* Chusana, *Hook.;* tenuis, *Pr.*

Lendigera Group.

* *Hairy, rarely scaly or chaffy.*

Sp. lendigera, *Sw.;* tomentosa, *Link;* Bradburii, *Hook.;* Szovitzii, *Fisch. et Mey.;* vestita, *Sw.?*

Lendigera Group.

** *Very scaly.*

Sp. scariosa, *Pr.;* myriophylla, *Desv.;* Lindheimeri, *Hook.;* elegans, *Desv.;* Fendleri, *Hook.;* speciosissima, *Alex. Braun.*

Rachis zigzag.

Sp. dichotoma, *Sw.;* flexuosa, *Kze.*

Fronds broad, triangular.

Sp. viscosa, *Link;* leucopoda, *Link;* marginata, *H. B. K.*

Involucres continuous. Pteridoideæ.

Sp. deltoidea, *Kze.;* Atherstonii, *Hook.;* cuneata, *Link;* profusa, *Kze.;* cornuta, *Kze.;* pulchella, *Bory;* coriacea, *Desne.;* viridis, *Sw.;* hirsuta, *Link;* canescens, *Kze.;* aspera, *Hook.;* caudata, *Pr.;* intramarginalis (Pteris id., *Kaulf.*); nitidula (Pteris id., *Wall.*)

Pteroideæ. *Clothed with yellow powder beneath.*

Sp. chrysophylla, *Hook.;* ochracea, *Hook.*

Genus V. Cassebeera, *Kaulf.*

* *Fronds digitate or pedate.*

Sp. triphylla, *Kaulf.*

** *Fronds pinnate or bipinnate.*

Sp. pinnata, *Kaulf.*; gleichenioides, *Gardn.*

Genus VI. Onychium, *Kaulf.*

Sp. auratum, *Kaulf.*; lucidum, *Spreng.*; Japonicum, *Kze.*; angustifolium, *Kze.*; strictum, *Kze.*; melanolepis, *Dcsne.*

Proceedings of Societies, &c.

The Phytologist Club.

One Hundred and Fifty-third Sitting.—Saturday, January 21, 1854.—Mr. Newman, President, in the chair.

The President read the following communications:—

Leucojum æstivum, Linn.

"This plant I saw in a willow-plot near Totnes Weir, South Devon, about a mile from the town, in June. It did not come under my observation in any of the gardens; nor could I learn that it had been observed before in the neighbourhood. Mr. Syme recorded, in this journal, some months since, that the locality for this plant by the Thames-side below Greenwich was probably destroyed. I think it might be worth remarking, that it was noticed by me, some few years since, on the same side of the Thames, growing lower down the river, nearer Woolwich; where, doubtless, it may be found in the ensuing spring. In June, 1841, I also observed it by the Thames, near Sonning, Berks; and by the side of the Lodden, near Reading, where it has been observed growing for upwards of thirty years past."—*T. B. Flower; Seend, near Melksham, January*, 1854.

Hypericum linarifolium, Vahl.

"I noticed this plant growing on the banks of the Teign, but whether in the same locality before recorded I know not. It was not

growing so luxuriantly as I have seen it in the Val des Vaux, La Haule, and St. Peter's Valley, Jersey. It would, doubtless, be found in other places on the South coast of England, if diligently sought after."—*Id.*

Vicia lutea, Linn.

"I do not recollect seeing this recorded in any of the lists for South Devon. I found it rather sparingly on the rocks at Black Head, near Torquay, during the past summer, together with Geranium purpureum, *Forst.* in E. B. S. t. 2648, and a beautiful dark-purple-flowered variety of Armeria maritima, growing with it, in which I could not perceive any difference of structure apart from the usual forms of A. maritima."—*Id.*

Diotis maritima, Cass.

"This is reported to have been seen on the South Devon coast. It formerly grew on the shingles in Babbicombe Bay, where I spent some time in searching for it, during the past summer, and in 1850, but without seeing the least trace of it. Has any botanist met with it on this coast of late years?"—*Id.*

Poa bulbosa, Linn.

"I noticed this plant growing rather plentifully at Plymouth, on rocks under the Citadel, and about the Hoe, in May last; also in abundance on Teignmouth Den. This latter station is, doubtless, well known to botanists, as being given in Turner and Dillwyn's 'Botanist's Guide,' on the authority of the late Dr. Beeke; but Mr. Watson having intimated, in the 'Cybele,' that it would be desirable to have the locality confirmed by more recent observation, I thought a note might again be recorded for it in Devon."—*Id.*

Udora Canadensis, &c., near Bedale.

"While botanizing with my friend Mr. Mark Hebblethwaite, of Camp Hill, near this place, in the low grounds a few miles West of Thirsk, during the month of August last, we were fortunate in meeting with several interesting plants, not of common occurrence in this part of Yorkshire; such as Butomus umbellatus, Hydrocharis Morsus-ranæ, Sagittaria sagittifolia, Rumex aquaticus, Ranunculus Lingua, Cicuta virosa, &c., &c. In returning homeward we had to cross the river Wiske, at the village of Kirby; and noticed a plant in the water with which we were unacquainted. Specimens of it were taken home; and our only guides, Smith and Babington ('Manual,' 2nd edit.), could

give us no information respecting it. The specimens were laid aside, and not noticed until lately; when a thought struck me that the plant might be Udora Canadensis. I immediately forwarded specimens of it to Mr. Babington, who very kindly informed me that I was right in my conjecture. I at the same time received specimens of the plant from Mr. Hardy, of Penmanshiels, N.B.; which he had collected in the lakes at Dunse Castle, and with which mine quite agree. Mr. Babington suggests that I ought to record the fact in the 'Phytologist,' in order that its first appearance in this part may be known in future. How the plant may have got there I am at a loss to decide, but shall make inquiry, and further examine the neighbourhood during the ensuing season."—*Thomas Simpson; Hopetown, near Bedale, Yorkshire, January* 16, 1854.

Linnean Society.

June 7, 1853.—Thomas Bell, Esq., President, in the chair.

Election of a Fellow.

The Rev. Thomas Hugo, M.A., was elected a Fellow.

Nomination of Vice-Presidents.

The President nominated Robert Brown, Esq., William Yarrell, Esq., Nathaniel Wallich, Esq., M.D., and William Spence, Esq., to be Vice-Presidents for the ensuing year.

Mr. Yarrell, V.P.L.S., exhibited a specimen of the dusky petrel (*Puffinus obscurus* of modern authors).

Letters of Linneus and other Naturalists.

Mr. Westwood, F.L.S., exhibited a volume of letters addressed to Philip Miller by Linnæus and various other naturalists and others, the property of Mr. Edward Layton of Watford; the more interesting of which, he stated, will shortly be published in fac simile. The volume contained, among others, letters from Dr. Richard Richardson, Charles Alston, Boerhaave, De Jussieu, Gronovius, Du Hamel du Monceau, George Clifford, Linnæus, De Zieten, Lord Petre, Hebenstreit, Van Royen, Guettard, Richard, Wachendorff, Garden, John Bartram, Stephen Hales, Marsigli, Oder, Forskahl, Schmidel, Pinard, Dr. John Hope, Sibthorp, Vandelli, and Dr. Tobias Smollet.

Umbellate Primrose.

Mr. Hogg, F.L.S., exhibited specimens of an umbellate variety of the common primrose (*Primula vulgaris*, var. β. of Smith's 'English Flora'), gathered in Thorp Wood, near Stockton-upon-Tees, on the 12th of May in the present year.

Read some Notes 'On the Artificial Breeding of Salmon and Trout, with Remarks on the Modes of Fecundating their Ova;' by John Hogg, Esq., M.A., F.R.S., F.L.S., &c.

Read also 'Notes on the Dipterous Parasites which attack the common Earwig and the Emperor Moth;' by George Newport, Esq., F.R.S., F.L.S., &c.

June 21, 1853.—Thomas Bell, Esq., President, in the chair.

Election of Fellows.

John Samuel Gaskoin, Esq., the Rev. Francis Thomas Macdougall, M.A., and S. James A. Salter, Esq., were elected Fellows.

Note from Nees von Esenbeck.

Berthold Seemann, Esq., F.L.S., laid before the meeting a communication which he had received from Prof. Nees von Esenbeck, President of the Imperial Leopoldino-Caroline Academy of Naturalists, congratulating the Linnean Society, in the name of the Academy, on its choice of Prof. Bell as President.

Earthquake at Sea.

Read the following Extract of a Letter from T. S. Ralph, Esq., A.L.S., to Richard Kippist, Esq., Libr. L.S., dated Jan. 4th, 1853; Brig Marmion, on her passage (from New Zealand) to Port Phillip:—

"I shall be rather anxious to hear how the Wellington people have gone on since my departure, for on the evening of Saturday last (1st of January, 1853), while off—some fifty miles west of—Cape Egmont, at 8.30 p.m., we, on board the brig, experienced a horrible shock of an earthquake, which caused the vessel to shudder and shake, just as if she had grounded on a shingle spit; and indeed, so loud was the sound under us, and so great the agitation, that I took it at the time to be a case of wreck with us, and knowing the sea was running rather

high, hardly expected to reach the deck before she might begin to break. The shock lasted about twenty seconds, during which I had only time to secure my watch and compass and seek the deck, when the whole was explained. I had the satisfaction of experiencing some eight others of diminished energy during the succeeding forty minutes, the last of which I measured, and found it did not exceed seventeen seconds. It was about equal in duration to the first, which of course I could not ascertain very accurately, except by reference to the time occupied by any succeeding ones."

Vegetation of Wellington, New Zealand.

Read also a 'Sketch of the Vegetation around Wellington, New Zealand;' by T. S. Ralph, Esq., A.L.S.

This sketch was prepared by Mr. Ralph, during his voyage above alluded to from Wellington to Port Phillip, from his notes made upon the spot. He describes the town of Wellington as situated at the southern extremity of a large port, of about nine miles in length and varying in breadth from four to six miles, surrounded by hills which are in many places covered to their summit with trees and shrubs. These hills, being composed almost entirely of a claystone rock, present a marked feature of roundness and abruptness without sharpness, and precipitous declivities full of channels and gullies from top to bottom. Wellington itself is built on two flats, with an intervening beach-line of houses to connect them, so that the town possesses but a small space of level land, which some ten years since is said to have been covered with dense bush, in which the settlers had no difficulty in losing themselves. But all the hills in the vicinity of the shore have had their timber felled, and the ground has since become covered with an undergrowth, chiefly composed of Leptospermum scoparium and L. ericoides (together known by the name of Manukâ), Friesia racemosa (Aristotelia serrata of Dr. J. Hooker's Fl. Nov. Zel.), Myoporum lætum, and in some places Myrtus bullata. A few of the deep gullies at the back of the first ridge are uncleared, and contain besides some arborescent ferns; but the hills in the rear of the town retain, especially on their upper parts, their older clothing of bush, consisting chiefly of some trees, such as Fuchsia excorticata, Knightia excelsa, Elæocarpus Hinau, two or three species of Coprosma, Geniostoma ligustrifolium, Drimys axillaris, Pittosporum tenuifolium, Brachyglottis repanda, and a few specimens of Br. rotundifolia. These are, in the denser parts of the bush, accompanied by Piper excelsum, Ripo-

gonum parviflorum (or Supple-Jack), climbing species of Metrosideros, and Dicksonia squarrosa and Cyathea dealbata, which are the commonest species of tree-ferns. Cyathea medullaris, Mr. Ralph found but once in this locality; and of C. dealbata he mentions having found a single specimen with a trifurcate stem, about 12 or 14 feet in height, and each of its divisions rising close to each other to a height of 4 feet. Smaller ferns, such as Hymenophyllum demissum and H. dilatatum, accompany these; Trichomanes reniforme is occasionally met with in extensive patches; and Polypodium Billardieri is by far the commonest of climbing ferns. During the winter season (generally from May to September) the gullies, being furnished with a steady supply of water, produce numerous Cryptogamic plants, which Mr. Ralph states that he has closely observed, but of which he can at present give only a brief notice. Of most of these he expects to be able to obtain the fructification, by subjecting them to a period of confinement in Ward's cases, in which with a less moist, but more regularly charged atmosphere, they seem well disposed to fruit. He has thus succeeded in fruiting Jungermannia hymenophylloides; and suggests this mode of cultivation to those who are desirous of obtaining fruiting specimens of mosses, Jungermanniæ, &c. Of Fungi, Mr. Ralph has collected about thirty species, while the list given in M. Raoul's work includes only eleven or twelve. He particularly notices Ileodictyon cibarium, which makes its appearance in June and July soon after heavy falls of rain, and a brick-red Polyporus (P. sanguineus of the 'Voyage au Pole Sud'?) as abundant in some places. He is inclined to think that in many instances mere varieties have been described as species. Thus he thinks that the two so-called new species of Parsonsia described in M. Raoul's 'Choix des Plantes' are only varieties of P. heterophylla; he has been unable to distinguish the two supposed species of Drimys; and in other instances he believes the differences to depend mainly upon the climate, temperate enough in sheltered situations, but severe in places exposed to the cold south-easterly gales either of winter or summer. Among the microscopic Fungi, Mr. Ralph particularly mentions a species of Trichia; the common Æcidium Senecionis which accompanies the Senecio vulgaris, and appears to him to extend to a species of Epilobium; and Perisporium vulgare? attacking Aristotelia in winter. Of Aristotelia he observes that although it is said to be exstipulate, he has met with several specimens in which the stipulæ were largely developed. Of introduced plants, the common water-cress grows by cart-loads in and about the streams for several miles about Welling-

ton ; and Mimulus luteus is also spreading itself along the streams and over the swampy places behind the town. He adds that he is very desirous of introducing some of the British plants which would probably thrive, such as Stellaria holostea and Antirrhinum Cymbalaria ; and states that he brought out with him from England Vallisneria spiralis, of which he has specimens intended for the Botanic Garden at Melbourne, from whence it may perhaps make its way to Sydney and Hobart Town. Mr. Ralph concludes his sketch by mentioning a species of Nitella (N. translucens ?) found in a rapid stream about five-and-twenty miles from Wellington.

Notes &c. of the late Mr. Griffith.

Read also a Letter from John McClelland, Esq., F.L.S., to R. Brown, Esq., V.P.L.S., dated Calcutta, 15th of January, 1853, and accompanying a large packet of notes and sketches by the late William Griffith, Esq., F.L.S., on the development of the ovulum in Santalum, Osyris, Loranthus and Viscum, as well as in several other genera belonging to different families of plants. These papers having been carefully examined, and compared with Mr. Griffith's memoirs published in the ' Linnean Transactions,' it was found that the bulk of them consisted of the materials from which he had constructed his memoir ' On Santalum, Osyris, Loranthus and Viscum,' printed in the nineteenth volume of the Society's ' Transactions.' In that paper he has given from these materials, in greater or less detail, all that he himself considered necessary to the elucidation of his subject ; and it does not appear (as might indeed be expected) that anything could be advantageously added to what he himself communicated to the Society. There are, however, some notes on the genus Modeccopsis, of which the characters only have appeared in our ' Proceedings ' (vol. i. p. 171), and which in some of the sketches is named Dactylium vagum ; on another plant presumed by Mr. Griffith to belong to Santalaceæ ; and on various Cucurbitaceous plants, affording some new and unpublished facts on the development of their several ovula, which it was thought desirable to lay before the Society, as supplementary to Mr. Griffith's communications on that important subject.

Dublin Natural-History Society.

Friday, January 13, 1854.—Robert Callwell, Esq., M.R.I.A., in the chair.

Donations.

Donations were announced from James R. Dombrain, Esq., and Mr. Ffennel.

Adventitious Roots of Jussiæa grandiflora.

Professor Allmann stated some observations he had made on a remarkable peculiarity of the adventitious roots of Jussiæa grandiflora. The author described a remarkable condition which he had observed in some of the adventitious roots of a specimen of this plant growing in the College Botanical Gardens. Some of the roots, which proceed from the nodes of the stem, instead of growing downwards, so as to fasten themselves in the mud at the bottom of the water in which the plant grows, assume an ascending direction, and grow into the air, where they present a very remarkable appearance, looking like portions of rush-pith attached to the stem of the plant. When examined by the microscope, they are found to have a central, slightly developed, woody axis, round which is a peculiar structure, formed of exceedingly delicate stellate cells, having between them large intercellular spaces, and constituting one of the most regular and beautiful examples of a system of air-chambers to be found, perhaps, in the whole vegetable kingdom. A singular fact connected with these air-chambers is, that they are not surrounded by any epidermal investment, but open directly into the external air. Professor Allmann also mentioned his discovery of a remarkable peculiarity of the woody fibres of the same plant; namely, the fact of these fibres being filled with starch granules, a condition of prosenchymatous tissue almost unique in the vegetable kingdom.

The Phytological Club,
(In connexion with the Pharmaceutical Society.)

December 5th, 1853.—Robert Bentley, Esq., F.L.S., A.K.C., &c., President, in the chair.

Donations to the Museum.

A donation of some rare plants from Mr. Bentley was announced, and some specimens of ergotised grasses from Mr. Blyth.

Enormous Caudex of Lastrea Filix-mas.

The President called the attention of the Meeting to the caudex of Lastrea Filix-mas, *Presl*, found by Mr. Shillitoe in Jersey. It was growing in a boggy soil and shady position. The specimen was remarkable for its great size, being in a dried condition about fourteen inches in length, and about a foot in circumference, a size quite unusual in temperate latitudes. All the ferns in the same locality were stated to be growing in the same luxuriant manner.

Ergotised Grasses.

Mr. Blyth read the following paper:—

"In presenting the specimens of ergotised grasses to the Phytological Club, I beg to offer the results of my experience in collecting them, so that future observations may either confirm or refute any deductions that may be drawn from them. I met with no instance of the disease until the middle of the month of August, and then in shady rather than in moist places, and found very few indications of it (especially directing my attention to marshy and wet places) from the sandy soil of Norfolk through the clay of Middlesex, to the marls and limestones of the western counties. A month later the disease increased so as to become epidemic, first appearing in uncultivated grounds, and gradually spreading over the whole country, so that towards the end of September, there was scarcely a spot where the grasses were not more or less affected. I present eight different specimens of grasses so affected, but it appears to prevail most in the Lolium and Dactylis; so abundant was it in these species, that a plentiful supply might have been collected from the commons and hedgerows, but I could not induce any of the herb-gatherers to collect it for me, so that I have had no opportunity of examining its chemical properties. Many farmers are acquainted with the disease, and according to them, its presence in fields is evidence of bad farming. Liming the soil has been found to be the best remedy for the evil. That draining alone is of little value to get rid of it, may be inferred from its having been more abundant in the Regent's Park than elsewhere, and as if to defy such an enemy, it especially flourished on the

ridges immediately over the draining pipes recently laid down in that soil.

"Much has been said on the origin and cause of the ergot, but the question is still left in an unsatisfactory state. The opinion I am induced to adopt from observation is, that moisture has nothing to do with originating the disease, although it may promote its development, as filth and dirt combined with moisture may promote the extension of any pestilence. Let us look at the condition of the atmosphere at the time of year it is developed. In the fall of the year, decomposition and fermentation are going on at a rapid rate, and the germs of dissolution spread throughout the whole organised world. At the same time, the physical condition of the atmosphere is in a state peculiar to the season. Modern researches into the properties of light have proved that there are three distinct classes of rays—the actinic or chemical, the luminous, and the calorific rays; the first prevail in the spring of the year and promote germination; the second prevail in the summer and promote the increase of the plant; and the third prevail in the autumn and promote the ripening of the fruit. Now we have in the fall of the year a diminution of the rays that sustain the vital energies of the plant, and render it less able to resist the attack of destroying forces. There are no doubt other conditions of the atmosphere not yet thoroughly examined or even thought of, which play an important part in the propagation or suppression of disease. But the fact remains that it is in the fall of the year when fungoid diseases become most prevalent or epidemic.

"It is only by the accumulation of observations that any law can be deduced. To obtain such will be interesting, to enable the agriculturist to get rid of the disease from his fields, and permit it to be propagated with impunity in waste places for its medical worth. It is with this object in view I have laid my recent observations before the members of this Club, and hope at a future season to be more successful in collecting a sufficient quantity for examining its properties, and to obtain the co-operation of members in different localities."

In connexion with the above subject, Mr. Blyth also read the following communication from Mr. Cobb, of Yarmouth :—

Mr. Cobb thus writes, "The practice of underdraining has become so general amongst us as to have changed to some extent the character of our Flora. Several species of marsh plants, once plentiful and peculiar to this neighbourhood, have disappeared, whilst their loss has been supplied by the introduction of a large number of species commonly found in cultivated districts. Large tracts of wet marshes,

which some years ago bore only a scanty crop of coarse grass and abundant Cyperaceæ, have been banked and drained, and now produce remunerating crops of corn. On the borders of such places the ergot was plentiful, especially on the Lolium perenne and L. arvense; I believe it is now found only in very wet seasons. As an example of the effect of this draining, I may state I have for the last three years been vainly endeavouring to meet with specimens of the Vibrio Tritici, which a few years ago might be gathered in every field."

The above was written in July. In a recent letter to Mr. Blyth, Mr. Cobb states that the ergot had become very prevalent, and might be met with almost everywhere.

Alteration in the Days of Meeting.

The President then announced that in future the meetings of the Club, in accordance with the wishes of the great majority of its members, would take place on the second Wednesdays in the months in which they were appointed to take place, instead of the first Mondays as heretofore. The next meeting would therefore be held on Wednesday evening, January 11th, 1854.

On the Germination of the Spores of the Uredineæ.

By M. L. B. Tulasne.*

The author had previously shown that the spores of the Uredineæ, like the pollen-grains of phanerogamous plants, had a variable number of pores, from which afterwards tubular filaments arose, apparently analogous to those which are the first result of the germination of the spore of a fungus.

In addition, he has proved that the so-called Æcidiolum exanthematum, *Unger*, may, very probably, be correctly regarded as equivalent to the spermogonia of the other fungi, so that in all probability it is not a sexual. According to new researches the germinal filaments of the spores do not all retain the simple, continuous condition, which was formerly assigned to them, and probably do not represent the commencement of the true mycelium.

When sown, the spores of Æcidium Euphorbiæ sylvestris, *D. C.*,

* From the 'Comptes Rendus' for June, 1853, and published in the 'Quarterly Journal of Microscopical Science' for January, 1854.

did not retain their continuity, but were subdivided into four or six unequal-sized cells, by means of transverse septa; there then appeared upon each of these cells, and particularly of the upper ones, a lateral short process (*spicula*), which soon supported an obovate and rather oblique tubular process. These tubes were the last vegetative effort of the spores; they became free (?), and produced only very slender filaments. Upon the separation of these bodies, the jointed tube from which they arose is emptied, and, like the spores, is destroyed; so that this sacculus or filament represents a sort of promycelium, a vegetation which intervenes between the primary spore or fruit, and those lesser follicles which are either secondary spores, or rather, perhaps, the only true and actual producers of the mycelium.

The same thing takes place in Puccinia, the spores of which are capable of germination while yet upon the parent plant. The spores of Puccinia graminis throw out tubes by which they lengthen two or three times, divide into cells and again produce reniform spores, which soon germinate. It is exactly the same in Phragmidium incrassatum, *Link.*

The Podisomata, also belonging to the Uredineæ, throw out from their two-sided fruits (*sporidia*) as many as eight tubular processes, crossing each other in pairs and superimposed one upon the other, which invest the fungus with a sort of pile; each of these produces several obovate spores, which may be collected in vast quantity.

In several Uredineæ (U. Rosæ suaveolens, Tussilaginis crassum), the tubular processes are capable of branching, and bear a still closer resemblance to a normal fungoid mycelium.

The spermogonia of the Uredineæ are highly aromatic. It is to them that is due the odour of Uredo suaveolens, &c.

M. Tulasne has not yet accurately investigated the germination of the spores of the Ustilagineæ. The elongated cell, which proceeds from the spores of Ustilago antherarum, *Tal.*, is probably analogous to the secondary spores of Æcidium and Puccinia.

In Ustilago receptaculorum, *Fr.*, organs, without doubt analogous to these secondary spores, are produced from a slightly-developed promycelium, consisting only of a few cells, but resembling that of Æcidium Euphorbiæ sylvestris, *D.C.*

Prospectus.

THE NATURAL HISTORY

OF

THE TINEINA.

It had long been a matter of reproach to English Collectors of Lepidoptera that they were not *observers* of the objects of their pursuit, and especially that they knew nothing of the preparatory states of the Insects they caught.

This was especially true with respect to the Tineina; but of late years more attention has been paid to their larvæ, and a considerable quantity of materials towards the Natural History of this Group having been collected, it is proposed to make it generally useful by publication on the following plan, by which the difficulty, hitherto urged, of its incompleteness, will, to a great extent, be obviated.

When it has hitherto been attempted to give the *Natural History of Insects*, in the order of the relation of the species to each other, it has followed in consequence of the economy of the majority of the species being unknown, that nine-tenths of the matter has been dry descriptions of perfect insects only. To obviate this serious defect it is now proposed to publish a Series of Octavo Volumes, each containing THE FULL NATURAL HISTORY *of Twenty-four allied Species;* thus the order of the appearance of the volumes will mainly depend on the progress made in investigating the Natural Histories of the Species of any particular Genus.

One important feature in the proposed work is the Plates, of which there will be Eight in each volume; they will be coloured, and *each will represent on a magnified scale the Transformations of Three Species.* These Plates will be brought out with great care, and the execution of them is entrusted to Mr. W. Wing. The Plates to Mr. Douglas's "Contributions to the Natural History of the British Micro-Lepidoptera," which have appeared in the Transactions of the Entomological Society, may be referred to as specimens.

Another important matter will be to introduce in its place, and as nearly as possible in the words of the original writer, the natural history of any species which has long ago been fully given by Reaumur, De Geer, &c., and which, though long since thus recorded, has been overlooked by subsequent writers, from the difficulty of satisfactorily identifying the nameless species for which it was intended.

Where previous authors have mixed together as belonging to one species observations applying to several species, care will be taken to separate these several remarks, showing to which species each belongs.

The letter-press will be *in Four languages*, English, French, German and Latin, so that the volumes will be intelligible to the collectors of England, France and Germany, whether linguists or not; the impediment of a foreign language in a work of this kind is ever found an obstacle to its wide circulation, and he who describes in Latin writes only for the scientific few, not for the unlearned many, whom it is desirable to attract to the study.

The price of the volumes will be made as low as possible, and little more than the expense of colouring the Plates.

But as even this moderate sum might put the work beyond the reach of many a hard-working Collector, the Editor proposes *to present a Copy of the entire Series* to every one who shall first discover and communicate to him *the Transformations of Twenty Species of* Tineina, with which the Editor was previously unacquainted.

The Volumes will be published under the superintendence of a Committee, consisting of

Mr. J. W. Douglas, 6, Kingswood Place, Lee;
Mr. H. T. Stainton, Mountsfield, Lewisham; and
Mr. W. Wing, 17, Priory Road, South Lambeth.

All Communications to be addressed to the Editor, Mr. H. T. Stainton, Mountsfield, Lewisham.

*** *Parties wishing to subscribe to the first Ten Volumes, at 7s. 6d. each volume, are requested to forward their names to some Member of the Committee.*

It is proposed to publish one or two volumes annually; the first volume before the close of the present year.

January 14th, 1854.

Remarks on Sarsaparilla.

By Berthold Seemann, Ph. D., F.L.S.*

A perusal of the various treatises on sarsaparilla tends to confirm the soundness of a remark made by Sir William Hooker, that those plants most useful to mankind are generally the least known botanically. Even Pereira, with all his industry and research, could give in his 'Elements of Materia Medica and Therapeutics' (London, 1850) but an unsatisfactory account of the botanical sources of the various sorts of sarsaparilla; and I well remember, that in the last conversation which I had with that great pharmacologist, he expressed an ardent wish that some competent person might be induced to investigate this perplexing subject. I am not vain enough to look upon myself as the "competent person" to whom Pereira wished to assign the investigation; and if the settlement of the question depended upon the opinion of great authorities, I would not have ventured to meddle with it; but, as it has solely to be decided by the simple elucidation of facts, I have made an honest attempt to cut the knot, the untying of which has been so often tried in vain.

M. de Warszewicz, during his last visit to the Volcano of Chiriqui, in Veraguas, collected specimens of a sarsaparilla, which he transmitted to Mr. Daniel Hanbury, who submitted them to me for determination. After a careful examination, I pronounced them to belong to Smilax officinalis of Humboldt and Bonpland; but, as Smilax officinalis, *H. et B.*, had been described from imperfect materials, Mr. D. Hanbury made, during a sojourn in Paris, a tracing of the original specimens from which the two botanists drew up their description. This tracing agreed in every essential point with the specimens from the Volcano of Chiriqui, and left in my mind no doubt that I had named them correctly. A fortunate coincidence confirmed this view. When M. de Warszewicz lately visited Bajorque, in New Granada, the place where Humboldt and Bonpland obtained their Smilax officinalis, he took the precaution to collect specimens of the sarsaparilla of that locality (where, by the bye, it has now become very scarce), which, in November, 1853, he placed in the hands of Mr. D. Hanbury, through whose kindness I was able to identify them, not only with Smilax officinalis of Humboldt and Bonpland, but also with the specimens collected on the Volcano of

* Read before the Linnean Society, December 6, 1853.

Chiriqui. Having now a thorough knowledge of the Smilax which Humboldt and Bonpland named S. officinalis, I began to examine the different species considered allied to it. The first one attracting my notice was Smilax papyracea of Poiret. On this species Mr. Robert Bentley had, in April, 1853, published an able article in the 'Pharmaceutical Journal;' and applying to that author for additional information, he, like a true man of science, most cheerfully granted my request, and willingly allowed me to examine the specimens which served as materials for his article. A critical examination of them convinced me, what I had already anticipated from comparing Bentley's description with the specimens of S. officinalis in my possession, and Poiret's diagnosis of S. papyracea, that Smilax papyracea and S. officinalis were identical. The second species arresting my attention was Smilax medica of Schlechtendal and Chamisso. This species has been well described, and a tolerably good figure of it has been published, by Nees; a close comparison of which with Smilax papyracea and S. officinalis proved it to be identical with them; so that the three names, S. officinalis, *H. et B.*, S. papyracea, *Poir.*, and S. medica, *Cham. et Schlecht.*, are synonymes of one species, a fact easily accounted for, when it is considered that the roots, stem, branches, and foliage from which the chief characters of these three supposed species had been derived are more variable than those who make species in their closets are apt to think.

Having now shown what number of synonymes belong to the true S. officinalis, I proceed to give an account of the plant itself, in order to prevent botanists from making similar mistakes to those they have already committed. Smilax officinalis grows on the slopes of mountains, to an elevation of 5000 feet above the sea, and is confined, as far as we at present know, to the Continent of South America, where it ranges between the 20th degree of North and the 6th degree of South latitude, and the 110th and the 40th degrees of West longitude. Jamaica, whence so great a portion of sarsaparilla used is annually obtained, does not produce any itself, as has been well ascertained; the article known by the name of "Jamaica sarsaparilla" is merely imported into that island from the Spanish main, and afterwards shipped for Europe and the United States of America. Nor are there any authentic data for believing that S. officinalis occurs in any other island of the West Indies, although such a distribution would be by no means an unlikely one.

The rhizome (chump) of the plant is cylindrical, and the roots (the sarsaparilla of commerce), abounding, according to age and the place

they grow in, more or less in starch, are as much as ten feet long, and generally furnished with branched rootlets (beards). The plant itself is in every part glabrous, and averages fifty feet in length. The stem is quadrangular, furrowed or striated, and on the edges clad with flat prickles, which are occasionally curved upwards. The branches are, like the stem, quadrangular, or often multangular, and either with or without prickles. The petiole, sheathing at the base, is furnished with two spirally twisted tendrils, which are often ten inches long, and either with prickles or destitute of them. The leaves are extremely variable; at times they are broadly cordate, almost trilobed, gradually tapering into an acumen; at others they are ovate-oblong, and even lanceolate and rounded at the apex, but always mucronate; they are generally 5-nerved, the two outermost nerves being mostly bifurcated, all the nerves being prominent on the under surface of the leaves, acutely edged and often furnished with prickles; the colour of the leaves is dark green, the under surface being a shade paler than the upper, but never glaucous, like many other species of Smilax; the length of the leaves varies from two inches to one foot, and the breadth (at the base) from one to six inches; in thickness they vary considerably, being either coriaceous or more or less paper-like, and they have, moreover, in the latter case, transparent lineolar dots. The peduncles are axillary and solitary, somewhat flattened, and they bear an umbella composed of about sixteen flowers. The flowers are still unknown. The berries are round and red, and of the size of a small cherry, or even smaller than that. Each berry contains from two to three plano-convex seeds, of a light brown colour.

Botanists, competent to judge of the true limits of species, are not likely to raise any objection to my uniting Smilax officinalis with S. papyracea and S. medica; but pharmacologists, unless supplied with the strongest proofs, will probably be disinclined to adopt the views I have advanced. They regard the different commercial sorts as essentially distinct from each other, and lay great stress upon certain characters, which, however striking to a superficial observer, are of little or no importance, botanically speaking. For instance, the so-called Lisbon or Brazilian sarsaparilla, that which comes to us in rolls about three feet long, is chiefly distinguished by having fewer rootlets, or beards, than that termed "Jamaica sarsaparilla;" and as the beards contain a great amount of matter for extract, it is on that account of less value in the market. But, if the roots of the Lisbon sarsaparilla are examined, it is plainly seen that the rootlets have been removed by some rough mechanical process, and that all the places where the

rootlets have been are clearly discernible, proving that the roots when gathered had as much beard as the sort usually received as Jamaica sarsaparilla, and making it probable that if the merchant buying up this Zarza in various parts of Brazil, would but inform the collectors that by preserving the beard they would not only save themselves much unnecessary trouble, but increase the weight and the commercial value of the roots they dig up, we should soon get all our "Jamaica" sarsaparilla from Brazil, and in a few years have difficulty in obtaining even a specimen of what is now termed " Lisbon sarsaparilla."

But the chief distinction which pharmacologists make between the various commercial sorts of sarsaparilla is that of " mealy " and " non-mealy." Mealy (sarsaparillæ farinosæ seu amylaceæ) are called those sorts in which there is, just below the outer cortical layer, a mealy coat, of greater or less thickness ; and non-mealy (sarsaparillæ non-farinosæ seu non-amylaceæ), those which are either wholly destitute of any meal, or have a very thin mealy coat. This distinction, it must be confessed, is not a nice one, and would not be admitted by a logical thinker ; but the very fact that it is adopted by a great body of pharmacologists is sufficient to invite criticism. It might be advanced as an *à priori* argument, that roots of two individual plants, though they may be mealy in the one and non-mealy in the other, need *therefore* not necessarily belong to two distinct species; and that he who has the misfortune to eat the waxy potatoes of Kamtschatka, is not justified in considering them different in species from the mealy ones he may have the privilege of tasting at the table of an English gentleman ; but I will dispense with that argument, and merely confine myself to stating, that the presence or absence of meal in sarsaparillas depends, it would seem, upon age, and the locality in which the roots are collected,—that the formation of starch is probably entirely regulated by physical circumstances. Anybody opening a bundle of Jamaica sarsaparilla, may pick out as many roots as he chooses being mealy at one end and non-mealy at another. We have here the clearest evidence that one and the same root assumes different characters of internal structure, and, as a matter of course, external appearance. This fact ought to convince any unprejudiced mind that the distinction alluded to is not tenable ; but, to furnish still another proof, I will allude to Bentley's specimens of Guatemala sarsaparilla.* The roots of those specimens are generally as mealy as any that are known ; yet

* This sort, after having been dyed, is sold by Mr. Keating, No. 79, St. Paul's Church-yard, London, under the name of " red Paraguan sarsaparilla ;" and was exhibited in the Great Exhibition, Sub-class II. No. 102.

not only do we find them at times destitute of starch, but they are, without doubt, botanically identical with Smilax officinalis, *H. et B.*

I am aware that the form of the cells of the nucleus-sheath of the roots has been considered by physiologists as furnishing good marks of distinction between the sarsaparillas of Central America and those of South America; and Schleiden declares that he can readily distinguish them microscopically. But this theory does not seem to rest on any safe foundation. Let Mr. Bentley narrate what he saw:—

"When examined by the microscope the cells of the inner cortical layers are found to contain bundles of acicular raphides, and a large number of the starch granules already described. The pith also is found commonly to contain a number of similar starch granules. The breadth of the pith is usually from one to one and a-half, or perhaps a little more, that of the woody zone. In this respect it resembles the Honduras sarsaparilla, and, according to Schleiden, also all those sorts of sarsaparilla which are obtained from Central America. The cells of the liber, or, as it is called by Schleiden, the *nucleus sheath*, are elongated radially or from within outwards, and have walls which are thicker on the inner than the outer side. In this respect it resembles the South American and Mexican sarsaparillas, which Schleiden says always present this peculiarity. This microscopical appearance is remarkable, because, according to Schleiden, the Honduras and all the Central American sorts of sarsaparilla are characterized by having the cells of the nucleus sheath either square or somewhat elongated transversely, and all their walls of nearly equal thickness, and he believes that he can distinguish Central American from South American and Mexican sarsaparillas from the appearances thus presented, combined with the different relative proportions of the woody layer and the pith already alluded to. But if this be true generally (which, so far as my experience goes, is not absolutely the case, having observed some sorts of Brazilian sarsaparilla in which the cells of the nucleus sheath were elongated somewhat in a direction from within outwards, and so far therefore agreeing generally with the anatomy of South American sarsaparillas according to Schleiden, but yet had their outer and inner walls of nearly equal thickness, and thus agreeing with the Honduras variety), it is certainly not true in the present sort, for here we have a Central American sarsaparilla which agrees with Schleiden's arrangement generally as regards the relative proportions of pith and woody layer, but differs from it in the cells of the nucleus sheath being elongated from within outwards or radially, and having walls which are thicker on the inner than the outer side."

I may, therefore, safely conclude that the greater portion of sarsaparilla is the produce of *one* species of Smilax; and that species is S. officinalis, *H. et B.* (S. papyracea, *Poir.*, S. medica, *Cham. et Schlecht.*) But I do not wish it to be believed that, by showing the identity of these three supposed species, I intend to abolish the commercial distinctions now so universally acknowledged in the sarsaparilla trade. As long as the Brazilians continue to strip the roots of their beard, and put them up in the same long rolls as they now do, there will always be Lisbon sarsaparilla in the market; as long as the inhabitants of the Spanish main continue to preserve the rootlets, we shall have Jamaica sarsaparilla; and as long as the climate and other physical circumstances of Guatemala remain unchanged, we shall always receive from that locality sarsaparilla distinguished by its abundance of starchy matter!

Additional Note.

After the foregoing paper had been read at the Linnean Society, an animated discussion ensued, which brought to light several interesting facts bearing upon the question brought forward. Mr. Wallace remarked, that during the whole of his travels on the Amazon and Rio Negro he had never seen the sarsaparilla growing; and he believed that that plant was solely confined to the slopes of mountains, and not to be met with in alluvial soil. "The Indians," he continued, "of the region explored by me never employ the sarsaparilla medicinally; and they cannot conceive what the Europeans do with the enormous quantities of the drug annually passing down the Amazon." "The medicinal properties of the sarsaparilla," said Dr. J. D. Hooker, "are still a subject open to great discussion. In general, physicians set little or no value upon the drug, while surgeons ascribe to it highly beneficial powers. I myself have taken sarsaparilla when I was ill, and it has done me no good; and again I have taken it when I was quite well, and have experienced no ill effects from it. With regard to the synonymes united with Smilax officinalis by Dr. Seemann, I may remark that I do not think they will be objected to by botanists who take a broad and comprehensive view of the vegetable kingdom. But, unfortunately, the number of such men is small, compared with those who, to the greatest disadvantage to science, multiply the synonymes by giving new names to every form that happens to be so unlucky as to assume periodically a feature different from the specimen which served as type of the original

diagnosis of the plant to which it belongs. I see in my mind's eye a state of confusion coming over systematic botany, such as was never witnessed in any branch of science; and I think it is the duty of every one who has the advancement of Phytology at heart, to oppose, by every means in his power, the lamentable condition which threatens to beset us. The opposition to the views advanced in the paper read anticipated from pharmacologists, will probably be more severe than that which Dr. Seemann has reason to expect from his botanical fellow-labourers. I will, therefore, mention a case bearing an analogy to the one above described. Pteris aquilina of England and Pteris esculenta of New Zealand differ from each other, in the root of the former being almost destitute of starchy matter, while that of the latter has an abundance of starch. Believing, as I do, that Pteris aquilina is the same all over the world, and that Pteris esculenta of New Zealand is specifically identical with P. aquilina of England, I account for the abundant development of starch in one locality, and its almost total absence in the other, by assuming that the physical constitution of New Zealand is more favourable to the development of amylaceous matter in Pteris aquilina than that of England; and in a similar manner does Dr. Seemann seem to account for the mealy and non-mealy sarsaparillas."

BERTHOLD SEEMANN.

Kew, February 15, 1854.

An Account of the Lichens of Cleveland, with their Localities.

By WILLIAM MUDD, Esq.

HAVING perused the pages of the 'Phytologist' for some time, and observed the paucity of contributions towards the lichens of this country, it has occurred to me that a list of the species found in that part of Yorkshire called Cleveland would not be uninteresting.

Before proceeding with the list, it will be necessary to take a glance at the arrangement of the genera. That of Acharius has been generally adopted by lichenologists in this country. However, it seems probable, from the investigations that have lately been instituted, that this celebrated system will, like the more general one of Linneus, be wholly abandoned; and in its room every writer upon lichens has proposed a new one of his own, of which, in truth, it may be said that it is impossible at present to say which will be adopted.

Owing to the unsettled state of the nomenclature, I have thought it necessary to refer the reader to works where they will find them either figured or described.

Sphærophoron coralloides, α. laxum, *Turn. and Borr.* E. Bot. 115. Sandstone rocks on Ayton Moor, Kildale Moor, &c.

Sphærophoron coralloides, β. cæspitosum, *Turn. and Borr.* E. Bot. 2474. Rocks at High Cliff; Guisbro' Moor.

Sphærophoron compressum, Ach. E. Bot. 114. Sandstone rocks, Baysdale and Oggeray Gill. The pale and compressed thallus at once distinguishes this species from the two preceding.

Endocarpon smaragdulum, Ach. E. Bot. 1512. With us a very abundant species on sandstone rocks, old walls, &c. Ayton Moor; walls near Castleton.

Endocarpon smaragdulum, Ach., var. *rufo-virescens*, Leight. Leight. Brit. Ang. Lich. plate 4, f. 4. On old walls near Roseberry; walls near Egton.

Sagedia viridula, Fries. E. Bot. Suppl. after t. 2623, fig. 2. On brick walls, Ayton and Eston.

Sagedia ochrostoma, Borr. MSS. Leight. Brit. Ang. Lich. p. 7, fig. 4. On the plastered walls of an old barn, Ayton.

Sagedia aggregata, Fries. E. Bot. 1752. On old ash-trees, Ayton; Newton Wood.

Pertusaria communis, DC. E. Bot. 677. On old trees, Airyholme Wood, Cliffrigg, &c. A very common species.

Pertusaria fallax, Hook. E. Bot. 1731. On ash-trees, Airyholme, rare.

Thelotrema lepadinum, Ach. E. Bot. 678. On the bark of old trees, Hob-hole, near Castleton; Mulgrave woods, near Whitby; Airyholme Wood.

Verrucaria nitida, Ach., var. *minor*, Leight. Leight. fasc. 1, 28. On smooth bark of ash-trees, Airyholme Wood.

Verrucaria biformis, Borr. E. Bot. Suppl. 2617, fig. 1. On the bark of oaks and ash-trees, Airyholme Wood; Cliffrigg; Esk banks, near Kuswarp.

Verrucaria rhyponta, Ach. E. Bot. 2597, fig. 2. On the smooth bark of young ash-trees, Airyholme Wood.

Verrucaria cinerea, Pers. E. Bot. 1891. On holly-bark, Newton Wood, Easby Wood, and Baysdale.

Verrucaria epidermidis, Ach. Leight. Brit. Ang. Lich. p. 17, fig. 3. On the thin epidermis of the birch and other trees, Lounsdale; Ayton; near Castleton.

Verrucaria epidermidis, β. analepta, *Hook.* E. Bot. 1848. On oak-bark, Cliffrigg; Airyholme Wood.

Verrucaria fusiformis, Leight. Leight. Brit. Ang. Lich. p. 18, fig, 2. On the bark of young ash-trees, top of Cliffrigg, rare.

Verrucaria gemmata, Ach. E. Bot. Suppl. 2617, fig. 2. Trunks of trees, Airyholme Wood, rare.

Verrucaria umbrina, Ach. E. Bot. 1499. Rocks and stones near Ayton, Carlton, and Stokesley.

Verrucaria mutabilis, Borr. MSS. Leight. Brit. Ang. Lich. p. 24, fig. 3. On rocks, Kildale and near Ayton. Several states of this variable species may be met with in Cleveland, including the form published in E. Bot. as acrotella.

Verrucaria immersa, Hoffm. Leight. Brit. Ang. Lich. p. 25, fig. 2. On basaltic rocks, Lanbraugh Rigg, rare.

Verrucaria rupestris, Ach. Leight. Brit. Angl. Lich. p. 25, fig. 4. On sandstone rocks, Newton Wood.

Pyrenothea leucocephala, Fries. E. Bot. Suppl. 2642, fig. 2. On the trunks of old trees (with patellulæ), Stogdale, Hob-hole, and Oggeray Gill. With us a very abundant species!

Pyrenothea vermicellifera, Kunz. Leight. fasc. 3, 102. On the bark of ash, holly, and maple, Ayton; Kildale; Mulgrave woods, near Whitby.

Strigula Babingtonii, Berk. Leight. Brit. Ang. Lich. p. 30, fig. 4. On laurel-leaves, Ormesby.

Arthonia spadicea, Leight. Leight. fasc. 3, 97. On hazel, Airyholme Wood; Newton Wood; Cliffrigg.

Arthonia lucida, Ach. E. Bot. Suppl. 2692, fig. 2. On the bark of old oaks, Oggeray Gill; Newtown Wood. Rather rare.

Arthonia Swartziana, Ach. E. Bot. 2079. On the smooth bark of trees, Airyholme Wood; Cliffrigg; Mulgrave woods, near Whitby.

Opegrapha varia, Pers. var. *notha*, Ach. E. Bot. 1890. On the bark of old trees near Guisbro'; Easby Wood; near Stokesley.

Opegrapha saxatilis, DC. E. Bot. 1790. Sandstone rocks, Newton Wood; Esk banks, near Egton.

Opegrapha rupestris, Pers. "Named by the Rev. W. A. Leighton, of Luciefield, Shrewsbury." Sandstone rocks, Newton Wood, but very rare.

Opegrapha herpetica, var. *subocellata*, Ach., subvar. *simplex*,

Leight. "Named by the Rev. W. A. Leighton." On the bark of ash-trees, Easby Wood, Airyholme Wood, Cliffrigg, &c.

Graphis scripta, Ach., var. *flexuosa*, Leight. Leight. fasc. 1, 18. On the bark of ash-trees, Airyholme Wood; Mulgrave woods, near Whitby.

Graphis scripta, Ach., var. *divaricata*, Leight. On hazel, Airyholme Wood.

Aulacographa elegans, Leight. E. Bot. 1812. On the smooth bark of trees, Easby Wood, Baysdale, and Stogdale.

Platygramma Hutchinsiæ, Leight. Leight. fasc. 4, 130. This species I first detected, rather sparingly, on rocks in Newton Wood, in 1852. Since then I have met with it in abundance on rocks in the Beech-bank, Kildale.

Biatora mixta, Fries. E. Bot. 1735. On the bark of old oaks, Airyholme Wood; Cliffrig; Esk banks, near Whitby.

Biatora preusnea, Leight. Leight. fasc. 390. On trunks of trees, Airyholme Wood; Easby Wood; Mulgrave woods, near Whitby.

Biatora uliginosa, Fries. E. Bot. 1466. Margins of the moor, Baysdale; sandy places on Eston Moor.

Biatora muscorum, Leight. E. Bot. 2217. On mosses and old walls, Kildale; Eston Moor; Esk bank, near Leatholme Bridge.

Biatora quernea, Fries. E. Bot. 485. On the rugged bark of old oaks, Easby Wood; Guisbro' Spa Wood; Bridle Gill, near Roseberry.

Biatora decolorans, Fries. E. Bot. 1185. On the ground, high part of Baysdale; near West House, Kildale.

Biatora aurantiaca. E. Bot. 948. Sandstone rocks, Newton Wood; walls near Ayton.

Biatora aurantiaca, var. *flavo-virescens*, Schær. Leight. fasc. 4, 119. Calcareous rocks, Broughton bank, rare.

Biatora aurantiaca, var. *irrubata*. E. Bot. 2245. Lecidea irrubata, *Ach.?* Walls at Ingleby, rather rare.

Biatora aurantiaca, var. *erythrella*, Leight. E. Bot. 1993. Basaltic rocks, Lanbraugh Rigg; Cliffrigg.

Biatora vernalis, Leight. E. Bot. 845. On the bark of old elms, Easby Wood; Airyholme Wood; Esk bank, near Whitby.

Parmelia calcarea, Fries. E. Bot. 820. On rocks, Buck bank, Kildale; Broughton bank.

Parmelia scruposa, Fries. E. Bot. 266. On walls and rocks, Lanbraugh Rigg; near West House.

Parmelia ferruginea, Fries. E. Bot. 1650. On rocks, Howden Gill, Roseberry; trees, near Easby; Airyholme.

Parmelia ulmicola, Borr. E. Bot. 1426. On elm-bark, near Easby; and on holly, Airyholme Wood.

Parmelia sulphurea, Hoffm. Hook. Brit. Fl. ii. 181. Basaltic rocks, Cliffrigg; Lanbraugh Rigg.

Parmelia cerina, Ach., α., Fries. E. Bot. 627. Ash-trees, near Ayton; Airyholme Wood.

Parmelia murorum, Ach., var. *citrina*, Schær. E. Bot. 1793. Brick walls, Ayton; Stokesley; near Yarm.

Parmelia ventosa, Ach. E. Bot. 906. Rocks, Ayton Moor, Guisbro' Moor, &c.

Parmelia Hæmatomma, Ach. Hook. Brit. Fl. ii. 190. Rocks, High Cliff; near Cook's monument; Ayton Moor.

Parmelia Turneri, Ach. E. Bot. 857. Trunks of old ash-trees, Airyholme Wood; Cliffrigg; Mulgrave woods, near Whitby.

Parmelia varia, Ach. E. Bot. 1666. On old posts and pales, Lanbraugh Rigg; near Eston.

Parmelia ostreata, Fries. E. Bot. 1501. On old stumps, Newton Wood; old hollow trees, Oggeray Gill; Baysdale.

Parmelia parietina, Duf., var. h. *substellata*, Fries. E. Bot. 1794. On old trees, near Ayton; near Easby.

Parmelia parietina, Duf., var. i. *concolor*, Fries. Leight. fasc. 1, 12. Old trees, near Ayton; rocks, Cliffrigg; Kildale.

Parmelia parietina, Duf., var. *polycarpa*. E. Bot. 1795. On old posts, near Stokesley; Crathorn; Yarm.

Parmelia lanuginosa, Ach. Hook. Brit. Fl. ii. 196. On rocks, Broughton bank; Baysdale.

Parmelia caperata, Ach. Hook. Brit. Fl. ii. 198. Trunks of trees, near West House.

Parmelia conspersa, Ach. E. Bot. 2097. On rocks and stones, on Battersby bank.

Parmelia aleurites, Ach. E. Bot. 858. On old trees, Baysdale; Oggeray Gill; Stogdale.

Parmelia physodes, Ach. E. Bot. 126. Trunks of trees, old walls, &c., Ayton Moor; with apothecia, on old trees, near West House.

Sticta herbacea, Delis. E. Bot. 294. Trunks of old trees, Baysdale; on moss, in Oggeray Gill.

Sticta pulmonaria, Ach. E. Bot. 572. Trunks of old trees, Baysdale; Stogdale; Easby Wood.

Sticta scrobiculata, Ach. E. Bot. 497. Trunks of trees, and upon rocks, Oggeray Gill.

Nephroma resupinata, Ach. E. Bot. 305. Mossy trunks of trees, Baysdale; Oggeray Gill; Stogdale.

WILLIAM MUDD.

Cleveland Lodge, Great Ayton,
February 14, 1854.

(To be continued.)

Proceedings of Societies, &c.

The Phytologist Club.

One Hundred and Fifty-fourth Sitting. — Saturday, February 25, 1854.—MR. NEWMAN, President, in the chair.

The President read the following communications:—

Epilobium alpinum in Wales.

"I have accidentally overlooked a remark in the 'Cybele Britannica' (iii. 427), upon my recording E. alpinum and E. alsinifolium to be found upon Snowdon. I have no specimen of either of them from that place, and do not now know my reason for believing, in 1835, that I had found the former on that mountain. As no other person has recorded it from thence, I think it most probable that I made a mistake in supposing that I had gathered it there." — *Charles C. Babington; Cambridge, February* 9, 1854.

Notes on new or scarce Irish Plants.

"'*Ranunculus confusus*, Godr.' Bab. In pools near Cork.

Matthiola sinuata, Br. On steep declivities by the sea at Ballyconigar, Co. Wexford, plentiful. First observed by John Morrison, Esq., of Enniscorthy, who pointed it out to me in its places of growth.

Silene anglica, L. Abundant in the sandy soil about Ballyconigar, *J. M.*

Ornithopus perpusillus, L. With the preceding species, but scarce.

'*Hypericum anglicum*, Bert.' Bab. in Ann. Nat. Hist. I have long observed this plant on walls by the road under Lota Wood, Glanmire, Cork (which is probably Dr. Balfour's station also); but do not

think it can be a native. In the 'Flora of Cork,' Lota Wood is given as a locality for several species not even naturalized in this part of Ireland; as Atropa Belladonna, Geranium phæum, &c.; and our 'H. anglicum' is most likely an escape also.

Melilotus vulgaris, Willd. This plant was found by J. Morrison growing in abundance by a newly cut road in Co. Wexford, during two successive summers. The plant has not latterly appeared, although the station was far removed from suspicion.

Callitriche pedunculata, DC., *β. sessilis*. In a clear pool, Glanseskin, Co. Cork.

Sedum album, *β. turgidum*, Ram. On rocks West of Queenstown, also on Hawlbowline Island, Cork Harbour, plentiful; discovered by Dr. Wood, who took it for S. dasyphyllum. In its short, thick leaves, 'foliis ovatis crassis,' *DC.*, of a yellow-green colour, and its short, obtuse petals, this form differs considerably from var. *α*. It is, at least, well established in the above stations.

Saxifraga stellaris, L. On the wet rocks of Hungry Hill, Co. Cork, a var. of this occurs which differs from the usual state, in its great size, stouter habit, tall and much-branched panicle, with leaves very patent and hirsute.

Saxifraga hirsuta, Fl. Hib. Hag's Glen and Devil's Ladder, Carrantuel, Co. Kerry, Aug. 1853. Flowers yellowish white, large.

Galium boreale, L. Bog near Clonmel, *Miss S. Grubb.*

'*Hieracium strictum*, Fr.' Head of Glenmalur, Co. Wicklow, Aug. 1852.

'*Hieracium corymbosum*, Fr.' With H. strictum.

Senecio Saracenicus, L. In two places near Stradbally, Queen's Co., apparently wild, *Thomas Chandlee.*

Diotis maritima, Cass. Amongst boulders on the strand at Tramore, Waterford, Aug. 1850.

Inula crithmoides, L. Rocks at Tramore, abundant.

Cicendia filiformis, Reich. Near Bantry, Glengariff, and Castletown, Berehaven, July and Aug. 1853.

Linaria minor, Desf. Waste ground near Carlow, *J. Morrison.* In gardens at Sunday's Well and Summer Hill, Cork, frequent.

Mentha piperita, L. Roadside near Ballitore, Kildare. Drain in Co. Cork, between Carrigaline and the sea, Sept. 1851.

Statice Bahusiensis, Fr. Common about Cork Harbour, where it has been taken for S. Limonium, *L.*

Statice binervosa, G. E. Sm., S. spathulata, *Auct.* Tramore, Waterford, *T. Chandlee.*

Polygonum Bistorta, L. Woods near Stradbally, Queen's Co., *T. Chandlee.*

Polygonum mite, Schrank. Marsh near Ballincollig Castle, Cork, Sept. 1853.

Salix ambigua, Ehrh. Near Glengariff, and at Dunboy, Berehaven.

Salix herbacea, L. Crevices of the slate rocks, summit of Sugar-loaf Mountain, Glengariff, July, 1853.

Ophrys muscifera, Huds. Bog between Ballitore and Athy, Co. Kildare, *T. Chandlee.*

Juncus acutus, L. Curacloa, Co. Wexford, *J. Morrison.*

Carex extensa. Good. Bantry Bay, July, 1853. Frequent around Cork Harbour.

Carex punctata, Gaud. Shore at Glengariff, rare; in greater quantity, but dwarfed, near Dunboy, Berehaven; July and August, 1853.

Carex fulva, Good., *β. Hornschuchiana*, Hoppe. Sugar-loaf Mountain, near the summit.

Bromus commutatus, Schrad. Fields near Fermoy, *T. Chandlee.*

Bromus Madritensis, L., B. diandrus, *Curt.* By the river at Carrick-on-Suir, Co. Tipperary, *Miss S. Grubb.*

Trichomanes radicans, Sw., T. speciosum, *Auct.* Under a shelf of rocks near the summit of Carrigeena, Kildorrery, N. of Co. Cork, at an elevation of about 1000 or 1200 feet, May, 1852.

Isoetes lacustris, L. Lake at Gongaunebarra, July, 1853.

I searched in vain for *Subularia aquatica*, which had been found in this locality, as well as the Isoetes, by Professor Harvey."
—*J. Carrol; February*, 1854.

On the Locality for Trifolium resupinatum, L., *near Bristol.*

"Several botanists, during the past summer, having carefully sought the neighbourhood of Bristol for Trifolium resupinatum, induces me to record the following note in the 'Phytologist:'—

"Mr. Drummond, while staying in Bristol during the summer of 1830, discovered, in the marshes about two miles below Shirehampton, Trifolium resupinatum, a specimen of which he presented to his friend Sir W. Hooker, and also to his friend Mr. Smith, an intelligent botanist, residing at Shirehampton; but previously to his leaving Bristol he conducted Mr. Smith to the meadow, in order that he might again seek it the following year, but was never able to find the least trace of the plant. In 1837, Mr. Smith kindly directed me

to the spot; and in July, 1839, Mr. Babington and myself carefully searched the locality, but were equally unsuccessful; and, having since visited the meadow every summer for the last ten years, I am fully satisfied that the plant is now lost by drainage. Mr. Smith, shortly before his death, informed me that it was never found in abundance, as it had been erroneously reported: but two or three specimens were all that Mr. Drummond ever met with. He had strong reasons for believing the plant to have been introduced."—*T. B. Flower; Seend, near Melksham, February*, 1854.

Coronopus didyma, DC.

"In the 'Cybele' a question is asked, whether this plant is native or introduced to the neighbourhood of Bristol. I should almost be inclined to say it was introduced, having observed it, always near ballast, in the neighbourhood for upwards of twenty years."—*Id.*

Lathyrus latifolius, L.

"Mr. Anderson thinks this plant undoubtedly wild in Stapleton quarries, near Bristol. It has recently been stated to be only a broad-leaved form of L. sylvestris *with smooth, compressed seeds*, and not the *tubercular* and *wrinkled seeds* of L. latifolius. Mr. Swete, who, I believe, is compiling a Flora of Bristol and its neighbourhood, will, doubtless, ascertain this fact, for future reference. And I may here take this opportunity of remarking, that the Flora of Bristol requires a careful examination and study, which it will, doubtless, receive from the above gentleman, and not, as it frequently happens, be a mere compilation from dubious authority, which would only tend to mislead rather than instruct the resident and non-resident botanist, and at the same time be utterly without value in a scientific point of view."—*Id.*

Phleum asperum, Jacq.

"This is recorded to grow at Kingsweston, near Bristol. I have repeatedly sought for this plant, without finding it. Mr. Smith, of Shirehampton, who cultivated it for many years in his garden, told me that he had frequently looked over every spot of ground in the neighbourhood where this grass was likely to be met with, for many seasons; and was fully convinced that it is not now found in the locality indicated. It is also stated, in the 'English Flora,' to grow in Badminton Park, near the Lodge; and it would be well if any resident botanist would verify this locality during the ensuing summer, and inform us near which of the lodges it is to be found, there being

several by which the Park can be entered. Mr. H. C. Watson, in his 'Cybele,' states that this species may, perhaps, have been passed over as P. arenarium; and it would be worth while carefully to examine any alleged inland localities for the latter, on the chance of finding P. asperum with it or instead of it."—*Id.*

On the Yorkshire Locality for Anacharis alsinastrum, Bab.

"Perhaps it may be worth while to note, to prevent any chance of misapprehension, that the Yorkshire station for this plant mentioned in last month's 'Phytologist' (v. 55), *viz.*, a pond below the bridge over the Wiske at Kirby Wiske, near Thirsk, is precisely the same that was recorded Phytol. iv. 365; and that in Phytol. iv. 721, I explained when and in what manner it had been introduced. At my last visit, about three months ago, it seemed scarcely to have spread beyond the limits of the pond in which it was originally planted."—*John G. Baker; Thirsk, February*, 1854.

A Supplement to the 'Flora of Yorkshire.'

"A Supplement to Baines's 'Flora of Yorkshire' is in preparation, and will most likely be ready for publication in the course of a few weeks. Any information relative to the rarer plants of the county, especially if they are not included in the original work or the 'Cybele Britannica,' will be thankfully received, by either Mr. Baines or myself."—*Id.*

Ophioglossum lusitanicum.

The President made the following communication:—

"I have much pleasure in being able to add this little fern to the British Flora. It has just been discovered, in some abundance, by Mr. George Wolsey, in the Island of Guernsey. It occurs, amid short and very level herbage sloping towards the South, on the summit of rocks on the South coast of the Island, and not far from Petit Bot Bay. On this elevated down are a few scattered and stunted furze-bushes, and around these the grass is, as usual, somewhat longer; and here the little adder's-tongue is not quite so minute as on the level turf, where it scarcely attains an inch in length. It grows in company with Trichonema Columnæ and Scilla autumnalis, and on the 17th of January was in full fruit. The very early fructification, and the minute size, of this species will readily account for its not having been previously observed; and may also suggest the *possibility* of its existing undiscovered in similar situations on the sea-coast

of Cornwall. I am indebted to the discoverer for a supply of living and dried specimens."

Devonshire Station for Lythrum hyssopifolium.

"I do not know whether any Devonshire station is recorded for Lythrum hyssopifolium; and it may be therefore worth while to mention that I met with it early last October, growing, for the space of a few yards, on the lower and moister part of a carriage-drive leading to Park House, Budleigh Saltern, South Devon. The plants were mostly small, and either had never flowered, or had lost all trace of having done so; they were confined to the left-hand side of the road. I had for years earnestly, but vainly, desired to meet with this Lythrum, and now stumbled upon it by the purest accident. If the ground, which has, I believe, passed into new hands, should not have been seriously disturbed before next summer, some botanist visiting the locality earlier in the season may chance to find it in blossom." [See Cyb. Brit. iii. 430.] —*Anna Russell; Clarendon Villa, Kenilworth, February* 17, 1854.

Bifid Ferns.

"I would also mention, with reference to two notices of bifid ferns, by Messrs. Piquet and Gissing, which have appeared in the late numbers of the 'Phytologist,' that on crossing the Grampians, last June, between Glen Shee and Braemar, I found a most luxuriant plant of Aspidium Lonchitis with one bifid frond, and one only, though there must have been at least from twenty to thirty others on the same root. The specimens were larger than any I had ever seen, many fronds, and the divided one among the number, being seventeen inches in length. The cleft was about two inches deep."—*Id.*

Laminaria longicruris.

"A notice of the occurrence here of this plant appeared in one of the numbers of the 'Phytologist' for 1851. It appears from the date attached to my specimen, that in place of being the *third* in order found upon the British coast, as I then supposed, it must stand as the *second*, and in one sense as the *first*; which, though in some respects of no great moment, is yet of some importance as a matter of accuracy. The following I believe to be the order of dates:—Orkney, 1838; Gamrie, May, 1850; Ayrshire, July, 1850; Ireland, August 1850."—*George Harris; Gamrie, Banffshire.*

Adiantum Capillus-Veneris on Cheddar Cliffs.

"Observing in a late number of the 'Phytologist' the recorded occurrence of Adiantum Capillus-Veneris near Bath, I beg to corroborate the fact of the existence of that fern in Somersetshire, having myself, in the year 1851, found a plant or two of it on moist rocks in the neighbourhood of Cheddar. I dried a few specimens, but left the roots uninjured; and, as they are in an out-of-the-way situation, I trust I may find them still there on my next visit to Somersetshire." —*William Henry Hawker; Horndean, Hants, February* 6, 1854.

Botanical Society of Edinburgh.

January 12*th*, 1854.—Professor Balfour, President, in the chair.

Donations to the Society's Library and Herbarium.

Donations were announced, from Dr. Anderson; Dr. Senoner, of Vienna; Mr. Moore, of Glasnevin, Irish plants, including Naias flexilis, Equiestum Moorii of Newman, Potamogeton longifolius, Erica mediterranea, var., &c.

Exhibitions.

Dr. Balfour exhibited a remarkable specimen of Hypnum cirrhosum, *Schw.*, which had been sent to him by the Rev. Mr. Nisbet, as having been gathered in Balur, North Uist.

Mr. G. Lawson exhibited specimens of Bryum warneum from the Tents Muir Sands, on the east coast of Fife, where it was discovered by Mr. W. M. Ogilvie, on the 27th of August last. It was associated with Bryum cæspititium, to which it bears a resemblance. The species is new to Britain, and appears to be rare on the Continent. It is described and figured by Bruch and Schimper in the 'Bryologia Europæa,' fasc. vi.

The following papers were read:—

Diatomaceæ in the Mull Deposit.

'On Diatomaceæ found in the Mull Deposit;' by Professor Gregory.

Having continued the study of this deposit for more than a year, Professor Gregory detected in it more than 150 species, a number

three times as large as has hitherto been observed in any other deposit. Of these, he mentioned on the present occasion about 140, of which about 120 were known and admitted already as British species.

The following species were new to Britain, but figured by continental authors: — Epithemia gibberula, Eunotia depressa, *Kutz.*, E. Camelus, E. bigibba, *Kutz.*, Himantidium exigerum, *Breb.*, Navicula Trochus, *Ehr.*, N. lævissima, Cocconema gibbum. Figures of these species were exhibited, and in the case of Eunotia bigibba nine remarkable varieties were figured.

The following species were described and figured as new to science: —Eunotia incisa, Pinnularia latestriata, P. undulata, P. exigera, P. tenuis, P. parva, Stauroneis rectangularis, Navicula apiculata, *Smith*, Cymbella tumens, Gomphonema Brebissonii? G. Hebridense.

Professor Gregory then directed attention to the remarkable variations of a form which had been referred by Mr. Smith to his Pinnularia divergens, but, as found in the Mull earth, had more than double the number of striæ which belong to that species. It occurs in several very striking varieties, and the conjecture was thrown out, that it is in reality not P. divergens, but a distinct species, including P. stauroneiformis, P. interrupta, and P. mesolepta of Smith, as well as what he took for P. divergens in the Mull deposit.

Some remarks were then made on the value of generic and specific characters in the classification of the Diatomaceæ. It was shown that the genera Cymbella and Cocconema, Eunotia and Himantidium, seem to be respectively separated on insufficient grounds. In regard to specific characters, it was pointed out that while certain species vary almost *ad infinitum*, others exhibit a remarkable degree of permanence. Examples of the former are Eunotia triodon, E. bigibba, Himantidium bidens, H. undulatum, Pinnularia divergens, and others; of the latter Eunotia tetraodon, E. Diadema, Navicula Trochus, N. serians, N. rhomboides, Pinnularia alpina, and others. It was shown that these very characters of permanence and variableness might be usefully employed as specific characters, and that viewed in this light, both of them afford strong proof of the real existence of species as natural divisions.

Professor Gregory announced that he had still several new forms found in this deposit to describe on some future occasion, and that he was engaged in the study of other deposits; in all of which he had already found species hitherto overlooked, and among these several of the new forms above named.

Specimens of the Mull deposit were exhibited under the microscope, as well as specimens of the deposit in its natural state, and of the polishing powder obtained from it.

Desmarestia Dresnayi on the Coast of Ireland.

'On the occurrence of Desmarestia Dresnayi on the Coast of Ireland;' by W. Sawers, Esq., Londonderry. Communicated by Dr. Greville.

In a letter to Professor Balfour, Mr. Sawers stated, "I have great pleasure in sending you specimens of an Alga, new to the shores of the United Kingdom. Specimens having been sent to Dr. Montagne of Paris, Member of the French Institute, by Dr. Landsborough and the Rev. M. J. Berkeley, Dr. Montagne writes, that he gathered the same plant at Fort St. Sebastian, Spain, in 1823, and published a description of it, with a plate, in 1842, in the 'Annales des Sciences Naturelles,' naming it Desmarestia pinnatinervia, and that it has been got by M. Crouan, at Brest, though rarely. Crouan makes it a variety of Desmarestia Dresnayi, but Montagne maintains the distinctness of his species, and retains his name D. pinnatinervia. I got the young fronds floating early in August at Molville, near the mouth of Loch Foyle, and have visited the locality frequently since, always getting a number of specimens, the great majority imperfect, being eaten by mollusks, &c. When fresh, it has the colour of a Laminaria, but is not so glutinous to the feel, and thinner. The root is a disk, and sometimes two or three fronds arise from the same disk; in some cases they are slightly proliferous where the margin has been injured. The frond is from 12 to 18 inches long, and 2 to 4 inches in breadth. The lateral nervelets are forked as in the frond of a fern."

Dr. Greville was of opinion that the plant must be referred to D. Dresnayi. He read a description of it, and exhibited a drawing, both of which will appear in the Society's 'Transactions.'

Flora of the Vosges.

'Remarks on the Flora of the Vosges;' by Dr. Dubuc.

Dr. Dubuc presented a parcel of plants received from Dr. Mougeot, to which his remarks had reference. He stated that the principal mountains of the Vosges were about 120 miles in extent, and run parallel to the Rhine, consisting chiefly of dome-shaped swelling hills, turfed on the top. Formerly they abounded in forests, but many of them are now bare. The highest summit of the Vosges does not exceed 4693 feet; their tops are generally formed of red and gray

sandstone, mixed with red and green argyllo-micaceous schists covering calcareous beds.

The comparatively southern situation of the Vosges on the continent, and their distance from the sea, necessarily produce a notable difference between their climate and that of the Highlands of Scotland. The winters in the Vosges are generally more severe, but the summers are warmer, especially in the numerous valleys by which they are intersected. There is also a considerable difference between the Flora of the Vosges and that of Scotland. Of 1600 phanerogamous plants found in the Vosges, 260 are species not found in Scotland, whilst in Scotland about 190 species are found which do not belong to the Vosges. Ferns are abundant in the Vosges, and some of them on the tops of the mountains, as Allosorus crispus, which occurs on the summit of the Ballon; but the total number of species (30) is less than that of Scotland (40). Dr. Dubuc read a list of the plants sent by Dr. Mougeot, and pointed out the characteristic genera of the Vosges and Scotland respectively.

He also read a letter from Dr. Mougeot, in which he mentioned that the fourteenth century of his collection of cryptogamic plants of the Vosges was ready.

Carex pædiformis, &c.

'On Carex pædiformis and other new Austrian plants;' by Dr. Adolph Senoner.

This communication accompanied a large parcel of Austrian plants, and contained remarks on some of the more interesting of them. Dr. Senoner particularly called attention to Carex pædiformis, *Mayer*, discovered during last summer in Hungary by Professor Harzlinziky, an interesting addition to the Austrian Flora. It grows upon limestone. There were also many new species from Dr. Schrer, who had at length resolved upon publishing a Flora of Transylvania. Aldrovanda Fachinia, Saxifraga Fachinia, &c., were among the other plants remarked upon.

Dr. Senoner expressed a wish to exchange land and fresh-water shells and ants with British naturalists for which he would be glad to return Coleopterous and other insects or plants.

State of the Society's Herbarium.

'Report on the State of the Society's herbarium;' by Dr. Anderson, Curator.

"Since the last report on the state of the herbarium was read.

great progress has been made towards the complete arrangement of the collection.

"Last autumn, the cabinets and their contents, with the exception of those containing the British plants, were removed to a commodious room in the new Museum at the Botanic Garden.

"The Society's collection of British plants, which still remains in the Society's rooms at the University, is now, by the labours of Mr. Lawson, in a most perfect state, and will prove a valuable aid to those who may be studying critical species, or the geographical distribution of plants in the British Isles. The European herbarium is also in a most satisfactory condition, but in consequence of the absence of our diligent member, Mr. Blackie, its arrangement is not yet quite perfect. The collection is one of great extent, comprising plants from nearly all the countries of Europe. During the last year it has been enriched by valuable contributions from Spain and Portugal, and by a very complete set of Scandinavian plants, from Professor Blytt, of Christiana, one of the Society's foreign members. The Asiatic portion of the collection, the most extensive and perhaps the most valuable of the whole, is now not far from being finished. This collection, I have said, is very extensive; it consists principally of plants from the East Indies, with a few from Arabia and Syria, part of the collection left to the Society by Mr. Christy. The Indian plants have been collected by such illustrious men as Roxburgh, Wallich, and Wight, also by the Countess of Dalhousie, Dr. Cleghorn, Captain Campbell, and Dr. Jameson, of the Company's Gardens at Saharunpore. By the labours of Dr. Cleghorn and myself, the naming and arranging of the species have advanced to the Orchidaceæ, but still much has to be done in the way of revision, &c. The Society's collection is rather rich in African plants, of which a considerable number of species is from the Cape of Good Hope, some named, but the greater part undetermined. They are nearly all glued down.

"The Society have also a large and good collection of plants from America, principally from North America, contributed by Dr. Gavin Watson of Philadelphia, Mr. James M'Nab, and Dr. Philip Maclagan. Some of them are already glued, and the whole collection is ready to undergo this process.

"The number of South American plants (rarities in all herbaria) is small. Within the last two years the amount has, however, been increased by very valuable parcels from Mr. Spruce, a collector in the northern provinces of South America. Since last report a consider-

able collection of Australian plants has been purchased. Before this there were few plants from that country in the herbarium.

"As regards the number of species in the herbarium, I fear I can give almost no correct statement until a catalogue is formed. From what I have said regarding the state of the various collections, it will be evident to all that it is such as not to admit of a list being drawn up at present.

"In concluding this Report, allow me, Sir, to congratulate the Society on the flourishing condition of its herbarium; and also to request that the younger members will come forward and assist in completing its arrangement. There is still much to do, and we only require workers; and lastly, I would remind any of our members that may go abroad, that though far removed from us and our meetings, they are still members, and as such they should remember the interests of the Society and its herbarium, and as a proof I would, as Curator of the Museum, request them to send home specimens of the plants occurring in their respective localities."

Election of Fellows.

The following candidates were balloted for and duly elected:—Ordinary Resident Fellows: John Kirk, Esq., 11, Lothian Street; John Lowe, Esq., 13, South Frederick Street; Mohammed Ali Soubki, Esq., 46, Minto Street; Mustapha Mustapha, Esq., 15, Argyll Square; Mohammed Ali Katib, Esq., 9, Argyll Square; William James Otto, Esq., 38, India Street: and A. H. Stonehouse Vigor, Esq., Cambridge, as a Non-Resident Fellow.

Foreign Member: Dr. Adolph Senoner, Vienna.

Associates: Mr. Alexander Buchan, Blackford, by Auchterarder; and Mr. James Ray, Edgehill Nursery.

February 9th, 1854.—Professor Balfour, President, in the chair.

Donations to the Library and Herbarium.

Donations were announced, from Professor Balfour; the Society of Natural Sciences at Cherbourg; Mr. Charles Howie; Mr. Fairbairn; Dr. Berthold Seemann; Messrs. Young & Co.; Mr. Alex. Oswald Brodie; Dr. Philip Maclagan; Messrs. P. Lawson & Son; Mr. Henderson; Messrs. Dickson and Turnbull; Mr. Isaac Anderson; Mr. Lyon; Mr. P. Fairbairn; and Dr. Douglas Maclagan.

The following papers were read :—

Anacharis Alsinastrum in Ireland.

'On the Occurrence of Anacharis Alsinastrum in Ireland;' by Dr. Dickie.

In a letter to Dr. Balfour, Dr. Dickie observed :—"The accompanying are, I suppose, specimens of Anacharis. If so, we have in Ireland the earliest known record of its presence in the United Kingdom if I mistake not. I have thought, at all events, it might be a point of interest to you, and worthy of notice at your Society." The specimens were accompanied by the following note by Mr. John New, gardener :—"About eighteen years ago, the pond at Waringstown was cleared of overhanging trees, when the Anacharis was immediately observed after the planting of some aquatics, making it necessary several times during the summer to clear it out. It is not known whether it existed in the pond previously to the above date, or was introduced with the aquatics at that time. For many years its name was not known to any person in the neighbourhood."

Botanical Trip to the Tents Muir.

'Notes of a Botanical Trip to the Tents Muir, in the north of Fife, in July last;' by Mr. G. Lawson.

The object of these notes was to call attention to a rich locality, which, although within easy reach, had not hitherto been much examined by Edinburgh botanists. The Tents Muir was described as an extensive tract, chiefly of sand dunes, extending along the coast from Ferry-Port-on-Craig to the river Eden. The pools and moist hollows on the Muir were rich in fresh-water Algæ, including Nostochineæ and Desmidieæ. The party did not find Isnardia palustris, and fancied that the abundance and luxuriance of Peplis Portula might have led to some mistake. The Peplis afforded a retreat for myriads of Hydra viridis.

Rare Plants in the Neighbourhood of Edinburgh.

'Notice of Localities for Rare Plants in the Neighbourhood of Edinburgh;' by G. R. Tate, Esq.

The following were among the plants noticed :—

Alyssum calycinum. On debris below the Queen's Drive, near Duddingston. "I noticed the plant in this locality in the month of May before it was in flower; at that time there were a number of specimens. As the season advanced and the locality became more

generally known, nearly the whole were eradicated. It is hardly possible that the Alyssum could have escaped the notice of the numerous botanists visiting Arthur's Seat and its neighbourhood, had it existed in this locality for any length of time. The probability is, that it had been introduced by seed sown, likely at no very distant date, by some one anxious to add a species to a Flora already overstocked with doubtful natives. Along with Mr. Bryce and Mr. E. W. Cropper, I obtained this plant at Burntisland, in very small quantity."

Sinapis Cheiranthus. In a field near Gullane. Not previously found in Scotland, and doubtfully indigenous.

Drosera longifolia. Obtained, in company with Mr. Ross, in bogs at the foot of the Knock Hill, not far from the station of Carex irrigua.

Hypericum Androsæmum. Near Culross.

Hypochæris glabra. Near Culross.

Lamium maculatum lævigatum. Banks of the Esk, about two miles above Musselburgh.

Rumex alpinus. In two localities near the Knock Hill, both near cottages.

Tulipa sylvestris. Sides of the Water of Leith, above Currie.

Zannichellia palustris. Canal, near Fountain Bridge.

Carex incurva. Sea shore between Longniddry and Prestonpans.

Nightshade Family.

'On the Nightshade Family;' by Peter Fairbairn, Esq.

Mr. Fairbairn detailed the character and properties of the Solanaceæ, and alluded particularly to the nature and qualities of the alkaloids yielded by different genera and species. He remarked that the effect produced by such alkaloids as Hyoscyamine, Daturia, and Atropia were different from those produced by Solanine, especially as regards the dilatation of the pupil.

Dr. T. Anderson remarked that Mr. Fairbairn had not adopted the division proposed by Miers into Solanaceæ and Atropaceæ, orders which were distinguished by æstivation and other botanical characters, as well as by their physiological properties. He did not consider that any correct evidence had been adduced of the narcotic properties of the species of Solanum. The infusion of S. Dulcamara could be given in large quantities without producing any narcotic effects, and its berries had been used as a preserve. The effects of the plants belonging to the order Atropaceæ did not develope themselves like those of opium. They were more of a stimulant character and were

slowly produced, and they were accompanied with marked enlargement of the pupil.

Value of Botanical Histology to the Medical Student.

'Illustrations of the Value of Botanical Histology to the Medical Student and Practitioner;' by Dr. Lindsay, Assistant Physician to the Crichton Royal Institution, Dumfries.

The author stated that the origin of this paper was due to the fact that there existed among the medical students of the Edinburgh University a strong feeling that they are compelled by the curriculum-regulations to learn too much of the collateral sciences of Natural History, Chemistry, and Botany,—Botany being, in particular, a science, the knowledge of which is regarded as quite unnecessary for the practice of their profession. The idea that the study of the scientific or theoretical disqualifies to a certain extent from the acquirement of practical knowledge, is a fatal error, and he believed that every Professor of the University could bear testimony to the fact that those students who had distinguished themselves in one department of their academic curriculum, generally did so equally in every other. Dr. Lindsay's object in this communication was merely to lay before such sceptics the results of the short experience of one but lately a *student*—of one who had been at the same time a scientific and a "practical man;" and to point out more especially by a few illustrations the value of microscopical Botany to the general practitioner.

Some considerable time ago, Dr. Lindsay had been applied to by a distinguished chemist to make a microscopical examination of some raw tobacco, with a view to the detection of any adulteration, the question at issue being a charge of adulteration, made at the instance of Her Majesty's excise against a wholesale tobacconist, on the ground of adulteration. The matter came to a public trial, in which Dr. Lindsay gave evidence. He found that the tobacco was *genuine*, from the nature of the hairs of Nicotiana, which have an apical gland, from the arrangement in a semi-lunar form of the spiral vessels of the leaf-stalk, as seen in a cross section, and from the number and appearance of the stomata. The surface of the leaves was covered in some places with very minute silvery crystals; in others with a dark viscid gummy matter, on the nature of neither of which could Histology, *per se*, throw a decided light. Instead of tobacco, the substance presented to Dr. Lindsay for examination might have been scammony, senna, mustard, or any other drug of vegetable origin; and he thought that, in such a case, the botanist was the only fit person to

decide whether, how far, and with what the drug had been adulterated. Vegetable drugs were especially liable to adulteration, and it was the duty of the practitioner to ascertain the purity of those he used; otherwise, in expecting a certain action from a certain drug, he might disappoint both himself and his patient. In evidence of the vast importance of the subject of adulteration of drugs, Dr. Lindsay referred to the excellent papers published by the Sanitary Commission of the 'Lancet.' Dr. Lindsay was of opinion that there ought to be a legislative enactment rendering druggists responsible for the quality of all medicines supplied by them, compelling them to test, and thus to ascertain the purity of every drug they sold.

The next illustration detailed by Dr. Lindsay was a case of suspected poisoning. During life no symptoms of poisoning appeared, and it was obviously of great importance to determine precisely the nature of the pultaceous contents of the stomach. These had a strong ratafia odour, and consisted of a thick, whitish, pasty matter, intermixed with the rind and pulp of some succulent fruit. Under the microscope, Dr. Lindsay detected, *inter alia*, abundance of the starch cells of wheat flour, and the sclerogenous cells and portions of the epidermis and parenchyma of the pear. Hence he reported the apparent contents of the stomach to be pudding of the nature of *blanc mange*, made of flour, milk, gelatine of some kind, and spices, and a large quantity of pears mostly roasted, and that in his opinion death resulted from the effects of a surfeit of food of a most unusual kind, flavoured with a large excess of some essential oil, containing as its active ingredient hydrocyanic acid. The chemical evidence afterwards proved the case to be one of poisoning by "quintessence of ratafia," a substance used to flavour puddings. In giving in his report of this case, the police authorities informed Dr. Lindsay that it was the first occasion on which they had authorised or received the report of a microscopic examination in a case of suspected poisoning, so that the importance of Histology in medico-legal cases is only beginning to be recognised by courts of law.

Dr. Lindsay then alluded to various observations made by him on the Histology of cholera, while resident physician of a cholera hospital. He mentioned that, by examining the matters vomited, the practitioner was often enabled to tell the exact nature of the patient's food, which was of especial importance in cases where he was unable to detail the history of the seizure, or where he or his friends were found to prevaricate or deny, as in the case of a patient using an interdicted article of diet. Moreover, many entophytes might be dis-

covered, having either a casual or accidental relation to disease. He had seen Sarcina Goodsirii in five out of ten cases of cholera where vomiting was present as a symptom. Dr. Lindsay entered into details respecting the so-called "cholera fungi," or "cholera corpuscles," or "cells," &c., about which there had been so much discussion, and which he referred to the ordinary articles of food.

Referring to the parasitic vegetable organisms that attack the human body, Dr. Lindsay stated that no part of the human system could be considered free, under certain circumstances, from the liability to their attacks, the delicate ramose mycelium of Fungi being capable of development in almost every situation. Among the lower animals they had been frequently noticed to occur to such an extent as to constitute distinct disease. The following instances were cited:—On the body of the silk-worm, Vibrios, Triton, and frog; on the scales of fishes; in the abdomen of hens, doves, and other birds, and in the trachea and lungs of birds; in the yolk of hens' eggs; on the face of the mouse; in the nasal mucus of the horse in glanders; and in the contents of the stomach and intestines of rabbits, oxen, sheep, and pigs. In the human subject they are familiarly known as the cause of some very disagreeable, though not dangerous cutaneous diseases, *e. g.*, Favus, Mentagra, some kinds of Porrigo and Pityriasis, and are also common in some forms of Aphthæ. They have been found coating the tongue, the fauces and œsophagus; also on ulcerated spots in the intestines; in vomited matter; in the fæces in very many disorders, *e. g.*, cholera, typhus, dothin-enterite, dysentery, and after simple errors in diet; in the posterior chamber of the eye; in tubercular cavities in the lungs and in sputa; in the fibrinous casts of the smaller bronchi expectorated in pneumonia, in carious teeth, in urine, milk, mucus, and pus, &c. In almost all the instances above mentioned, the microscope could alone detect the existence of the parasites, and many an obscure and anomalous case of disease has the microscope been instrumental in clearing up. Dr. Lindsay remarked, however, that he was not prepared to grant it the same supreme importance in diagnosis which is attributed to it by some observers; but the fact could not be doubted that it was a most important adjunct alike to the general medical practitioner, the man of science, and the pharmaceutist, in their search after truth.

Dr. Lindsay alluded to the Torbanehill coal case as one in point, which, although totally unconnected with medicine, has called for the scientific opinions of medical men.

He concluded his paper by some interesting observations on the

subject of medical education. After detailing his own case, and pointing out the various ways in which he had been called upon, in the course of his professional duties, to avail himself to the utmost, not only of his medical knowledge, but of general scientific and literary education and acquirements, he proceeded to observe:—"It appears to me that Natural History, Botany, and Chemistry ought, *inter alia*, to be compulsory branches of general education, with which every medical student ought to be acquainted before he enters upon the more purely medical department of his curriculum. Have examinations on these subjects prior to the first *annus medicus* if you will. This is merely a matter of arrangement and convenience to be adjusted between the professors and students. The thorough knowledge of these subjects furnishes an admirable training for the mind of every gentleman who has any pretensions to education; and so far from reducing the number of such collateral and accessory branches of the curriculum (or rather, as I think, they ought to be of the general preliminary education), or rendering more lenient the graduation examinations, I hope the tendency will be found to be greatly to increase the former in extent and the latter in strictness, and thus endeavour to raise the standard of attainment among the alumni of our Alma Mater. Among the classes which might advantageously be added to the preliminary education of the medical student, are the German and French languages, Natural and Moral Philosophy, Metaphysics, Mathematics, and Drawing."

Dr. Balfour remarked that Dr. Lindsay had been a distinguished student of medicine at the University of Edinburgh, and that he was a zealous naturalist. His donations to the Museum of Economic Botany indicated his zeal and ability. In recommending Natural-History studies as not incompatible with practical acquirements in medicine, Dr. Lindsay's own case might have been given as an illustration of such a combination. Dr. Balfour was satisfied that those students who distinguished themselves in Botany were those who were also eminent in all their medical studies. Many of them now occupied eminent positions in various parts of the world. Among recent students of Botany, he alluded to Dr. Lindsay, Dr. Sanderson, Dr. Cobbold, Dr. Murchison, and Dr. Priestley, as examples of zealous botanists who have shown themselves able practitioners.

Dr. Balfour was satisfied that Natural History and Botany ought to form part of the study of every general student, and that they ought not to be confined to the medical curriculum. No student should enter on the practical study of medicine without having undergone a

preliminary examination on these subjects. The degree of M.D. he stated was not merely an evidence of medical knowledge, but a University honour, implying general knowledge and a good University education. Medical students often attempted to do too much within a short period, and hence the aversion which some of them displayed to the study of Natural Science as taking up too much of the time required for other studies. He was satisfied that the study of Natural History was a most important means of preparation for the pursuit of other departments of medicine, inasmuch as it called forth powers of observation and of diagnosis which were eminently required by the medical practitioner. The present day, he thought, was one for enlarging the acquirements of the physician and not for reducing them. There must be something more than a minimum of study for one who is to appear with advantage in society. The attention now paid by all classes to Natural Science must tend to raise the studies of those who enter learned professions.

In concluding his remarks, Dr. Balfour alluded to a paper in the 'North British Review,' in which it is observed:—"We have never been able to discover any satisfactory reason why Mineralogy, Geology, Botany, and Zoology, should be considered requisite to form a physician more than a divine or a lawyer. Nor should it be concealed, that in consequence of those branches of science being attached to the medical faculty, parents are too frequently prevented from directing their youth-head to the study of those important departments of knowledge with which every one laying claim to a 'liberal education' should be acquainted. Let the patrons of the University remove these chairs from the medical faculty, and place them, together with Chemistry, in their proper position along with the usual classes in the faculty of arts. The demand for attendance on such classes by the medical faculty need not be altered, while a new and important element would be introduced in reference to the degree of 'Master of Arts.'"

Election of Fellows.

The following gentlemen were balloted for and duly elected:—Ordinary Resident Fellows: Robert Daw, Esq., 21, Albany Street; William T. Smith, Esq., 71, Cumberland Street; Thomas James Walker, Esq., 31, St. James's Square; John Ross, Esq., 18, Claremont Crescent. Non-Resident Fellow: Thomas Barclay, Esq., Sheriff-Clerk of Fife.

Foreign Exchange Club,
(In connexion with the Botanical Society of London.)

The following is the Prospectus of the above Club :—

"As the majority among the Members of the Botanical Society of London are interested only in the distribution of British plants, the Council have determined to limit the general operations of the Society to exchanges of British specimens. To meet the requirements of those who desire foreign specimens also, it has been considered advisable to form a subordinate Club, specially intended for that purpose.

"*Rules for Membership and Distribution.*

"I.—The Foreign Exchange Club of the Botanical Society of London is intended to facilitate exchanges of Botanical Specimens between British and foreign botanists; supplying the former with foreign, and the latter with British and foreign, plants.

"II.—Any Member of the Botanical Society of London may be admitted a Member of the Club on filling up the annexed form, and transmitting it and sixty postage-stamps to the Distributor.

"III.—No person residing in Britain can be eligible as a Member of the Club, if not a Member of the Botanical Society of London.

"IV.—Any Botanist residing out of Britain may be admitted a Foreign Member of the Club on his sending a parcel of foreign plants, selected in accordance with lists of desiderata for the Club, obtained by application to the Distributor.

"V.—The Botanical Society of London shall supply such specimens of British plants as may be required by the Foreign Members of the Club.

"VI.—The Botanical Society shall place at the disposal of the Club the whole of its present stock of foreign plants, and all others that may be received by it during the existence of the Club; in acknowledgment of which the Club shall pay over to the Treasurer of the Botanical Society any surplus funds that may remain after payment of the expenses incurred by the Club.

"VII.—The funds necessary for carrying on the operations of the Club shall be provided by making a charge on the specimens sent to British Members.

"VIII.—The charges for specimens shall be made in accordance with the following scale; namely:—

1st. Miscellaneous specimens, selected by the Distributor	1*d.* per species
2nd. Miscellaneous specimens, selected by the Distributor, but from particular Natural Orders or countries, named by the Members	2*d.* per species
3rd. Desiderata, marked by the Members on lists of species to be forwarded by the Distributor	3*d.* per species

"IX.—British Members sending foreign plants which are desiderata to the Club shall be allowed to claim an equivalent parcel in exchange, without payment under Rule VIII.

"X.—No charge shall be made on any specimens sent to Foreign Members.

"XI.—The Club shall pay the carriage of all parcels sent to it, but not that of any sent out to its Members.

"XII.—If the funds of the Club prove insufficient to meet its expenditure, the Members shall be called upon to make up the deficiency, by an equal subscription amongst themselves, not exceeding 5*s.* in any one year.

"XIII.—If the funds prove still insufficient, the Club shall be dissolved.

"XIV.—The Curator of the Botanical Society of London shall conduct all the operations of the Foreign Exchange Club, and shall do so at such times and in such a manner as may least interfere with the business of the parent Society.

"XV.—Lists of parcels and species received shall be, from time to time, sent out to the Members, to enable them to make their selections of species, countries, &c., under rule VIII.

"XVI.—Further information may be obtained by applying to the Distributor, 'J. T. Syme, Esq.,—Botanical Society,—20, Bedford Street,—Covent Garden,—London.'"

An Account of the Lichens of Cleveland, with their Localities.
By William Mudd, Esq.

(Continued from page 76).

Verrucaria subalbicans, Leight. Leight. Brit. Ang. Lich. p. 25, fig. 1. On the mortar of old walls, Ayton and near Easby. Named by the Rev. W. A. Leighton.

Verrucaria epipolœa, Ach. E. Bot. 2647, f. 3. On a large stone in Airyholme Wood.

Verrucaria nigrescens, Pers. Leight. Brit. Ang. Lich. p. 27, f. 1. On stones, near Middlesbro'.

Calicium clavellum, Turn. and Borr. E. Bot. 1465. On old posts, Newton Wood; Cliffrigg.

Calicium hyperellum, Ach. E. Bot. 1832. On the bark of old oak-trees, Easby Wood; Guisbro' Spa Wood.

Calicium trachelinum, Ach. E. Bot. 414. On the bark of an old tree, near Busby Hall.

Calicium debile, Turn. and Borr. E. Bot. 2462. On an old dead tree, near Mulgrave Castle, Whitby.

Calicium curtum, Turn. and Borr. E. Bot. 2503. Common on old stumps, Cliffrigg, near Stokesley, &c.

Calicium turbinatum, Pers. E. Bot. 2520. On the crust of Pertusaria communis, *DC.*, near Guisbro'; Easby Wood, Ayton.

Coniocarpon cinnabarinum, DC. E. Bot. 2151. With several varieties, on ash, oak and hazel; Airyholme Wood; Newton Wood.

Opegrapha herpetica, Ach. E. Bot. 1789. On the bark of trees, Airyholme Wood; Kildale.

Opegrapha rubella, Pers. E. Bot. 2347. On the bark of trees, Airyholme.

Opegrapha atra, Pers. E. Bot. 1753. On the bark of various trees, common near Ayton, &c.

Graphis serpentina, Ach., var. *divaricata*, Leight. Leight. fasc. 1, 21. On trees, Airyholme Wood; Baysdale.

Graphis serpentina, Ach., var. *tremulans*, Leight. Leight. fasc. 1, 22. On ash-trees, Newton Wood; near Kirkleatham.

Umbilicaria polyphylla, Hoffm. E. Bot. 1282. On rocks, Howden Gill; Battersby Moor.

Lecidea canescens, Ach. E. Bot. 582. On trees and rocks, near Easington; Guisbro'; with apothecia, near Ayton.

Lecidea pinicola, Borr. E. Bot. 1851. On old pine-trees, Newton Wood; Ayton Moor; near Stokesley.

Lecidea leucoplaca, Chev. Leight. fasc. 4, 125. Ash-trees, Airyholme Wood, abundant; Esk banks, near Whitby.

Lecidea elæochroma, Ach. E. Bot. 1450. On the smooth bark of trees, Airyholme Wood; Cliffrigg; Ayton.

Lecidea dubia, Turn. and Borr. E. Bot. 2347. On old wood, Baysdale; on pine-trees, Kildale, near West House.

Lecidea silacea, Ach. E. Bot. 1118. On old walls, Ayton Moor; walls near Castleton.

Lecidea chalybea, Borr. E. Bot. Suppl. 2687, f. 2. On old tiles, Ayton.

Lecidea confluens, Ach. E. Bot. 1964. On rocks and walls, Ayton Moor; Battersby Moor; near Whitby.

Lecidea atro-alba, Ach., var. *concentrica*, Fries. E. Bot. 246. On rocks and stones, Ayton, Kildale Moor, &c.

Lecidea geographica, Ach., var. *sphærica*, Schær. Leight. fasc. 3, 93. On rocks, Cliffrigg and near Cook's monument.

Lecidea geographica, var. *atro-virens*, Schær. Leight. fasc. 4, 128. On rocks, Battersby Moor; Ingleby Greenhow; Eston Moor.

Lecidea insularis, Nyl. On rocks, top of Cliffrigg! "On submitting a specimen of this species to the Rev. W. A. Leighton for examination, he very kindly informed me that it was identical with a specimen which he had received from Sweden."

Biatora rivulosa, Ach. E. Bot. 1737. On rocks, Battersby Moor; Lanbraugh Rigg.

Biatora anomala, Ach. E. Bot. 2155. On the bark of old trees, Airyholme Wood; Cliffrigg.

Biatora icmadophila, Eh. E. Bot. 2, 372. Turfy places under the shade of heath, Ayton Moor; near Castleton.

Biatora byssoides, L. Hook. Brit. Fl. ii. 137. On rocks and old walls, sometimes on the ground, Lanbraugh Rigg; Ayton Moor; Kildale.

Beomcyes roseus, Pers. E. Bot. 374. On heaths, upon the ground, Ayton Moor; Kildale Moor; near Danby Castle.

Cladonia alcicornis, Schær. E. Bot. 1392. On mossy rocks, Larchbank; near Ayton.

Cladonia cervicornis, Schær. E. Bot. 2574. Moist rocks, Howden Gill; Castleton Moor; Baysdale.

Cladonia ventricosa, Schær. E. Bot. 2362. On decayed stumps of old trees, Stogdale; Sloethorn Park.

Cladonia pyxidata, Schær. E. Bot. 1393. On heaths and in woods, frequent; Ayton Moor, &c.

Cladonia gracilis, Hoffm. E. Bot. 1284. On an old wall, on Battersby Moor, abundant.

Cladonia fimbriata, Fr. E. Bot. 2438. Hedgebank near Roseberry; near Stokesley.

Cladonia deformis, Schær. E. Bot. 1394. On old stumps, Coat Moor, Lounsdale.

Cladonia bellidiflora, Schær. E. Bot. 1894. On heaths, Ayton Moor; Westerdale; near Danby; Sleddale.

Cladonia furcata, Hoffm. Hook. Brit. Fl. ii. p. 236. On the ground in heathy places, Kildale Moor; near Cook's monument.

Cladonia rangiferina, Hoffm. E. Bot. 173. On moors, &c.; Ayton, Kildale Moor, &c.

Cladonia uncialis, Hoffm. E. Bot. 174. On heaths, near Roseberry; Guisbro' Moor; Lounsdale.

Stereocaulon paschale, Ach. E. Bot. 282. On rocks, and sometimes on the ground, Battersby Moor, abundant.

Stereocaulon nanum, Ach. Hook. Brit. Fl. ii. p. 233. On Ayton Moor, in turfy places.

Usnea florida, Ach. E. Bot. 872. On the branches of old trees, Lounsdale; Sloethorn Park, with apothecia.

Usnea barbata, Fr. E. Bot. 257. On old pine-trees, top of Broughton bank.

Usnea barbata, var. *hirta*, Fr. Leight. fasc. 1, 1. On stunted trees, Ayton Moor; Baysdale; Oggeray Gill.

Evernia jubata, c. *implexa*, Fries. E. Bot. 1880. Trunks of trees, Baysdale; Kildale Moor; Broughton bank.

Evernia prunastri, Ach. E. Bot. 859. Trunks of trees: the apothecia are frequent in the Larchbank, and in Kildale woods.

Evernia furfuracea, Man. E. Bot. 984. Trunks of old trees, Ayton Moor; Sloethorn Park; near Castleton.

Ramalina calicaris, var. *fraxinea*, Fries. E. Bot. 1781. Common on the trunks of trees, Ayton, &c.

Ramalina calicaris, var. *fastigiata*, Fries. E. Bot. 890. Trunks of trees, frequent; Stokesley, &c.

Ramalina calicaris, var. *canaliculata*, subvar. *farinacea*, Fries. E. Bot. 889. Trunks and branches of trees, Cliffrigg, &c.

Ramalina polymorpha, Ach. Hook. Brit. Fl. ii. 224. On rocks, Roseberry, and Howden Gill.

Ramalina scopulorum, Ach. E. Bot. 688. On rocks, at Highcliff.

Cetraria aculeata, Fr. E. Bot. 452. On the ground and on old

walls, Ayton Moor, Battersby Moor, &c. Several varieties may be met with on Guisbro' Moor, so far as regards size and ramification.

Cetraria glauca, Ach. E. Bot. 1066. On rocks and trees, near West House; Battersby Moor; near Cook's monument.

Cetraria sæpincola, Ach. E. Bot. 2386. On pine-trees, near Kildale; near West House; Ingleby.

Peltigera horizontalis, Hoffm. E. Bot. 888. About the roots of trees, Oggeray Gill.

Peltigera aphthosa, Hoffm. E. Bot. 1119. Shady rocks, Beech-bank, Kildale.

Peltigera canina, Fr. E. Bot. 2229. Upon the ground, among moss, &c., very common; Ayton.

Peltigera spuria. E. Bot. 1542. On mossy banks, Oggeray Gill; Ayton Moor; near Roseberry.

Peltigera rufescens. E. Bot. 2300. On banks, and mossy trunks of trees, Ayton; near Newton.

Solorina saccata, Ach. E. Bot. 228. In the clefts of rocks, Beech-bank; Kildale.

Parmelia saxatilis, Ach. E. Bot. 603. Frequent upon trees, rocks and stones, Ayton Moor, Kildale, &c.

Parmelia saxatilis, Ach., var. *furfuracea*, Leight. Leight. fasc. 2, 46. Upon rocks, near Cook's monument.

Parmelia saxatilis, Ach., var. *omphalodes*, Fries. E. Bot. 604. On rocks and stones, Ayton Moor; Ingleby; near Castleton.

Parmelia olivacea, Ach. E. Bot. 2180. On the bark of trees, pales, &c., frequent; Ayton; Stokesley.

Parmelia pulverulenta, Ach. E. Bot. 2063. Very common on the trunks of trees, Ayton.

Parmelia stellaris, Ach. E. Bot. 1697. Frequent on the bark of trees, Ayton, &c.

Parmelia obscura, a. *orbicularis*, Fr. E. Bot. 1942. On the bark of ash-trees, Ayton; near Guisbro'; Kirkleatham.

Parmelia incurva, Hook. E. Bot. 1375. On sandstone rocks, Battersby Moor.

Parmelia saxicola, Ach. E. Bot. 1695. On rocks and stones, Ayton Moor; Lanbraugh Rigg.

Parmelia saxicola, Ach., var. *areolata*, Leight. Leight. fasc. 3, 81. On rocks, top of Cliffrigg.

Parmelia murorum, Ach. E. Bot. 2157. On rocks and walls, near Stokesley; Mulgrave Old Castle; Danby Castle.

Parmelia vitellina, Ach. E. Bot. 1792. On old pales, near Easby; on walls in Lounsdale.

Parmelia tartarea, Ach. E. Bot. 156. On rocks, at Highcliff; Sloethorn Park; near Castleton.

Parmelia pallescens, var. *parella*, Fries. E. Bot. 727. On rocks, Lanbraugh Rigg; Newton Wood; walls near Whitby.

Parmelia glaucoma, Ach. E. Bot. 2156. On rocks, Lanbraugh; Kildale; near Castleton.

Parmelia subfusca, var. *discolor*, a., Fries. Leight. fasc. 4, 115. On the bark of trees, Airyholme Wood, Stokesley, &c.

Parmelia subfusca, var. *distans*, Fries. Leight. fasc. 4, 116. On the bark of poplars, Ayton; near Easby.

Parmelia coarctata, Ach. E. Bot. 534. On stones, near White House; rocks, Newton Wood; Esk bank, near Egton.

Parmelia atra, Ach. E. Bot. 949. On rocks, Lanbraugh Rigg; old walls, Ayton Moor; near Guisbro'.

Parmelia pezizoides, Dicks. E. Bot. Suppl. 2801. On mossy stones, near Battersby; rock in Baysdale.

**Parmelia aurantiaca*, Ach. E. Bot. 1305. On the bark of ash-trees, near Newton; Kirkleatham; Wilton woods.

Gyalecta cupularis, Ach. E. Bot. 739. On the escarpment of the oolitic limestone, top of Broughton bank.

Gyalecta pineti, Leight. E. Bot. 1863, lower figure. On the bark of old pine-trees, Newton Wood; Cliffrigg.

Collema limosum, Ach. E. Bot. Suppl. 2704, f. 1. Clay-banks, near Eastington.

Collema cristatum, Ach. E. Bot. 834. Clay-banks, near Easby; Stokesley; Yarm.

Collema ceranoides, Borr. E. Bot. Suppl. 2704, f. 2. On banks, near Coatham, and Marske.

Collema fragrans? Ach. E. Bot. 1912. On the bark of ash-trees, near Ayton; Airyholme Wood.

Collema palmatum, Ach. E. Bot. 1635. On Coatham sand-hills, near Marske.

Collema crispum, Borr. E. Bot. Suppl. 2716, f. 1. On stones near Ayton; old walls at Pinchingthorp.

* My friend, Mr. Baker, of Thirsk, informs me that Fries now considers this a Biatora, and names B. aurantiaca, *E. Bot.* 948, γ. clava, and places Parmelia aurantiaca, *Ach.* E. Bot. 1305, as the normal form.

Collema lacerum, Ach. E. Bot. 1982. On walls, near Mulgrave Castle; old mossy trees, Baysdale, and Oggeray Gill.

Collema muscicola, Ach. E. Bot. 2264. On rocks partly covered with moss, Lanbraugh Rigg.

Collema spongiosum, Ach. E. Bot. 1374. Among moss in a ravine on Guisbro' Moor; Battersby bank.

It must not be considered that the above are all the lichens that this district produces: many species are yet under examination; and I hope at no distant period to lay before the readers of the 'Phytologist' many additional species.

It will, no doubt, be observed that I have followed no particular arrangement; my reasons for doing so are, that Fries's 'Lichenographia Europæa Reformata' is but little known to British botanists, and the works by the Rev. W. A. Leighton are not yet completed. So far as they are published, I have followed the names of the latter gentleman, believing they will be eventually adopted. The remainder are from Fries's 'Lichenographia' and 'English Flora.'

Errata.—In my article in last month's number, I find two typographical errors, which I am desirous of correcting. Page 73, for "Arthonia lucida" read "A. lurida, *Ach.*;" and p. 74, for "Biatora perusnea" read "B. premnea."

William Mudd.

Cleveland Lodge, Great Ayton,
March 17, 1854.

Proceedings of Societies, &c.

Linnean Society.

November 1, 1853.—Thomas Bell, Esq., President, in the chair.

Election of a Fellow.

Cuthbert Collingwood, Esq., M.A., was elected a Fellow.

Inflorescence of Cycas revoluta and Macrozamia spiralis.

Mr. James Yates, F.L.S., offered some observations on the inflorescence of Cycas revoluta and Macrozamia spiralis, illustrated by specimens.

Cycas revoluta.—Prof. Miquel, of Amsterdam, to whom we now look for the best systematic arrangement and description of Cycads, remarks, that male specimens are rarer in Europe than female. "Specimina culta," says he, "omnia ferè feminea. Masculinum in Horto Petropolitano exstat, ubi bis floruit (Otto u. Dietr. Gartenz. vii. 1839, p. 24)." See his 'Monographia Cycadearum,' 1842, folio, p. 24, and his "Genera et Species Cycadearum viventium" in the 'Linnæa' for 1843, p. 683. This observation is certainly true in regard to Great Britain. Since the first example of the female at Farnham, described by Sir J. E. Smith in the 'Linnean Transactions,' vol. vi., not less than six other plants have borne fruit, and some of them two or three times, viz. at Chatsworth, Ravensworth Castle, Laurel Mount and Knowsley near Liverpool, Kew, and Lauderdale House, Highgate. The plant last alluded to (Mr. J. Yates's) flowered in 1845, and subsequently produced four magnificent crowns of leaves, the finest of them consisting of fifty-three leaves. In October, 1852, the first appearance of another cone was indicated by scales, covered with their soft yellow tomentum; but it remained long doubtful whether this would turn out to be another crown of leaves, or a head of fruit-bearing fronds. In April last the question was determined, as the peculiar palmate fronds were clearly seen, and were closely folded over one another, having the form of a somewhat flattened spheroid and the size of a moderately large melon. In May these fronds or spadices increased rapidly and vigorously. They expanded and remained open three days, so that the young drupes, also covered with down, and nearly the size and form of horse-beans, were easily discernible. They then closed again, and the whole spheroid became as compact and solid as before. It was conjectured that this temporary disclosure of the drupes, supposing it to be the habit of the plant, might be a provision for their fecundation, admitting of the access of the pollen. The fronds, which are crimson, shaded by their thin covering of yellow down, are now spread in all directions and have attained their full development, except that the drupes, perhaps in consequence of the cold, wet, and dull season, fall without having come to perfection. It

is also to be observed, that these fronds, about 110 in number, are closely set and spirally arranged upon a very short axis. The distance between them and the fronds of 1845, is about 8 inches or 20 centimetres, showing an elongation of the trunk of 1 inch for each year.

Miquel mentions only one male plant, viz. that at St. Petersburg: and in this country it cannot be ascertained that more than two males have produced cones, to wit, those in the Botanic Garden at Sheffield, and that belonging to Henry Ricketts, Esq., at the Grove, Brislington, near Bristol. The Sheffield plant has now flowered thrice. Its first cone, produced in England, is preserved in the Museum at York; its second belongs to the Royal Botanic Society in the Regent's Park; its third appeared this year, and, that it might be suitably displayed, the whole plant was transported to York last summer and was there publicly exhibited. It is now taken back to Sheffield. It appeared that this male was purchased by the late Earl of Derby, formerly President of the Linnean Society, about A.D. 1825, together with the female already noticed, which is a noble specimen, still preserved at Knowsley, and which bore fruit in 1850. The Brislington specimen has been in the possession of its present owner about half a century, and may be between fifty and sixty years old. In 1847 it raised a cone or spike 58 c. (*i. e.* 23 in.) long, which is agreeable to the ordinary size and form of this production; and now it has raised a second, but with a remarkable anomaly in its development. This is not half the length of its predecessor, and, instead of being drawn to a point, is curtailed and terminates abruptly in a tuft of barren scales, resembling those which, as intimated above, always precede the rise either of a crown of leaves or of a fruit-bearing cone. A check in the development of the cone appears to have been sustained, preventing the further prolongation of its axis, and at the same time causing its scales to be no longer dilated and antheriferous.

Macrozamia spiralis.—Mr. Yates next exhibited a small, but perfect specimen of the cone of a male plant, which he lately imported from Sydney. This is probably the first time that a Macrozamia has produced a cone in this country. Together with the recent cone Mr. Yates showed also two old specimens, which had been sent with the living plant, by W. S. MacLeay, Esq., F.L.S., and which that gentleman obtained near his own residence at Elizabeth Bay. One of these two specimens is very remarkable in consequence of being

double. At the top of a peduncle of the usual size and appearance are fixed two equal, parallel, and perfect male cones. Mr. Yates showed that some approach to this double formation is occasionally found in the genus Encephalartos, inasmuch as the axis of the cone is sometimes bifid near the summit.

It was also remarked, that the peduncle of Macrozamia bears leafy appendages, and that these have not been found in any other recent genus, but are very conspicuous on the peduncles of the fossil Zamites gigas, which is found in the oolitic strata near Whitby.

Parasitism of Rhinanthus Crista-galli.

Read some "Observations on the parasitic habits of Rhinanthus Crista-galli, and its injurious effects on the growth of Barley." By Joshua Clarke, Esq., F.L.S., &c. These observations were made during the last summer in the parish of Debden, in the county of Essex. The field contained four acres of barley, the soil a stiffish clay; the Rhinanthus was growing in patches at different parts of the field, some of which were much larger than others, and occupying at least half the surface, by which about two acres of the barley were completely destroyed, and the remaining part of the crop very much injured, both in quantity and quality. The farm consisted of 170 acres, principally clay soil, such as is usually called heavy land; thirty acres of it were of barley, about ten of which were destroyed by this plant. This loss, combined with other causes, induced the occupier to give it up.

In regard to the mode by which the Rhinanthus effects the injury, Mr. Clarke states that the fibres of the roots attach themselves to the fibres of the barley, on which they form small round tubers, or what perhaps may be more properly called spongioles, which embrace the fibres so effectually, that they suck the juices of the plant so as to starve it, and in most instances ultimately destroy it; these spongioles are formed of cellular tissue. A correct knowledge of the habits and natural history of a plant may lead to its eradication, but in this instance it is a matter of considerable difficulty, the ordinary method of destroying weeds by a summer fallow being of no avail, as the Rhinanthus does not grow in clean earth. Mr. Clarke has for some years been trying to raise it from seed in clean earth, but has never succeeded. The other method of destroying weeds by green crops in rows is equally unsuccessful, as it does not grow among green crops. As it is annual, it certainly should be pulled up before

it seeds; and as it grows on a clay soil, and to no great extent except in a wet season, the land should be effectually drained.

November 15, 1853.—Thomas Bell, Esq., President, in the chair.

On the Genus Hodgsonia.

Read a notice "On Hodgsonia, *Hook. fil. et Thoms.*, a new and remarkable genus of Cucurbitaceæ." By Dr. J. D. Hooker, F.R.S., F.L.S., &c., and Dr. Thomas Thomson, F.L.S., &c.

A very remarkable plant, one of the handsomest and most curious of the whole natural Family, with the inflorescence and flower of Trichosanthes, but in fruit widely different from any of the extensive natural Order to which it belongs. It has been extremely well described by Roxburgh as a species of Trichosanthes, and was cultivated many years ago in the Calcutta Botanic Garden, where it is now lost. A figure of the female flower is also in the Museum of the India House. Root branching. Stem climbing for 80 to 100 feet, festooning lofty trees. Wood of very remarkable structure. The almost axillary conical bodies, referred to buds, but generally described as stipules, are most remarkable and deserve careful study. Flowers, very handsome, appear in May, and the fruit ripens in autumn and winter; female flowers are rare, and from being solitary, are less conspicuous than the males. Ovarium covered with small warts that project through the dense, almost velvety, rusty pubescence, 1-celled, with three parietal placentæ that project into the axis, and clearly show the normal structure of Cucurbitaceous fruits to have a parietal placentation; cavity of the ovarium filled with watery pulp, that hardens as the fruit advances to maturity and becomes of the consistency of a hard turnip, full of watery fluid that escapes in large drops when the fruit is pierced. Ovules suberect, in pairs, each pair collateral and at right angles to the radius of the ovary; of these the ovule next the axis ripens, and that next the circumference of the ovary becomes accrete to the outer one and seldom ripens. This position and œconomy of the ovules is quite unique in the order. Flower about 4 inches long; the limb 3 inches in diameter, inodorous; fringes of the petals 5—6 inches long. Calyx with several deep brown polished tubercles or warts towards each

angle or tooth. Tube of the calyx lined with a thickened disk, which surrounds the style and is in contact with it; it lines the staminal tube of the male flower. Berry 6—10 inches across, of a fine deep red-brown colour, covered with a very short tomentum; pulp whitish. Seeds erect, very large, each double, resembling a 2-celled nut, covered with an adherent vascular pulpy coat, which penetrates deep fissures in the free face of the larger seed. Testa hard, somewhat porous; the free surface of the larger seed deeply grooved in anastomosing channels; outer surface rather corky or spongy, inner hard, smooth, polished. The testa is slit longitudinally down its base towards the hilum for one half or one inch in the larger seed, and has a smaller corresponding slit on the smaller nut. A compressed prolongation of the endopleurum (which is very soft, thick, and corky) projects a little through this fissure, and the radicle points towards it. Embryo flat, of the form of the seed, occupying a narrow slit in the centre of the endopleurum, nearly as broad as the cavity of the testa, surrounded by a delicate membrane. Cotyledons plain, white, very oily; radicle small, conical; plumule 2-lobed, lobes notched. The seeds are eaten by the natives of Sikkim, who call the fruit Kat'hior pot. An original specimen is in Sir William Hooker's herbarium, from Buchanan Hamilton, labelled as from Penang, with the MS. name of "Trichosanthes Theba." Roxburgh's trivial name of heteroclita has been retained, for though it was intended by its illustrious author to imply that the plant varies from its congeners of the genus Trichosanthes, it will apply sufficiently well in future for a plant which is heteroclite in respect of the natural family (Cucurbitaceæ), to which it undoubtedly belongs. Blume's descriptions are quite insufficient to determine whether it belongs to his M. macrocarpa or hexasperma, or either. These plants are no doubt congeners of Hodgsonia, and considering that the H. heteroclita ranges from the level of the sea at Penang, lat. 6° North, to alt. 6000 feet in Sikkim, lat. 27° North, the probabilities are great that it is also found in Java. The leaves vary from 2-lobed to 5-lobed, usually the latter, and the lobes are much acuminate, rarely blunt, coarsely serrated towards the tips or quite entire.

The genus is named in honour of B. H. Hodgson, Esq., F.L.S., Resident at Dajiling, where the plant was discovered, and whose scientific services in the Himalaya justly merit the honour of so splendid a plant.

Potamogeton flabellatus.

Read also "Notes on Potamogeton flabellatus, *Bab.*, a new British species." By Charles Cardale Babington, Esq., M.A., F.R.S., F.L.S., &c. This paper is published, *in extenso*, in the 'Phytologist,' iv. 1158.

December 6, 1853.—Thomas Bell, Esq., President, in the chair.

Sarsaparillas of Commerce.

Read, further, a paper entitled "Remarks on Sarsaparillas." By Berthold Seemann, Esq., Ph.D., F.L.S., &c. This paper appears, *in extenso*, in the 'Phytologist,' v. 65.

December 20, 1853.—Thomas Bell, Esq., President, in the chair.

Election of a Fellow.

John Dickinson, Esq., F.R.S., was elected a Fellow.

Eye-spot of Infusoria and Microscopic Algæ.

Read also, "Remarks on the so-called Eye-spot of the Infusoria and Microscopic Algæ." By Arthur Henfrey, Esq., F.R.S., F.L.S., &c.

Mr. Henfrey states, that in the course of an extensive series of observations on the microscopic Algæ, especially in investigations of the effect of re-agents upon the tissues and contents of the cells, he has frequently been completely baffled by the uncertainty which presented itself as to the real existence of colours exhibited by objects. The decomposition of light taking place in these minute bodies under high magnifying powers is such, that even with lenses most carefully corrected and fully sufficient for all general purposes of investigation, we are left altogether in doubt as to whether or not the phænomena of colour arise from refraction. He uses lenses made by Ross about eight years since, a quarter and an eighth of an inch, the latter of excellent defining power, and is convinced that these are not inferior to

any glasses in use on the Continent. But with them, particularly the latter, delicate membranes seen edgeways exhibit a blue tint, under certain circumstances, often giving rise to a difficulty in arriving at a decided opinion in questions connected with cellulose, when using the sulphuric acid and iodine test. Many phænomena might be cited in reference to this subject, but the main point to which he wishes to direct attention is, the doubt existing in his mind as to the nature of the red spot described by Ehrenberg as an "eye" in the Infusoria. He has observed this object chiefly in the unicellular Algæ and zoospores, and was first led to suspect that the red colour depended on unequal refraction, in the cells of Chlamydomonas Pulvisculus. In these he has frequently found several red spots on one individual cell, which however could not all be brought into focus at once, and he has decidedly observed, that when these spots were brought into clear and well-defined focus, they appeared as bright colourless granules. Frequently no red spot at all could be found.

The idea suggested by this was further confirmed by noticing the similar variations of colour according to form in a granule (nucleolus?), in a half-decomposed, colourless, diseased cell.

Finally, he had recently found that he could bring out the crimson colour most beautifully in the central spot or "hilum" of starch granules. When the lens is a little too far away from the object, the hilum appears like a minute black spot; then, carrying the lens a little nearer, it comes out as a beautiful crimson spot exactly like an "eye-spot" in every respect. Adjusting the focus exactly, by bringing down the lens a little more, the hilum is seen as a well-defined spot of a brighter character than the rest of the starch-grain, but altogether devoid of any prismatic colour.

Although dwelling but briefly on this question here, Mr. Henfrey states that he has had it under consideration for some time, and he thinks it desirable to make known his supposition now, in order that other microscopists working with different lenses may direct their attention to the point, and furnish the results obtained with them, since almost all high objectives differ slightly in their correction.

On the Crescentiaceæ.

Read further, "Notes on the Natural Order Crescentiaceæ." By Berthold Seemann, Esq., Ph.D., F.L.S., &c.

Dublin Natural-History Society.

March 10*th*, 1854.—Dr. Croker, M.R.I.A., President, in the chair.

Fructification of the Genus Desmarestia.

Mr. Gilbert Sanders read the following paper "On the Fructification of the Genus Desmarestia."

"At the request of my friend Dr. Allman, I beg to present to the Dublin Natural History Society a short description of the fructification of Desmarestia as observed in the species D. ligulata. Dr. Harvey, in both editions of his 'Manual' and in the 'Phycologia,' as well as every other Algological authority I am acquainted with, records the fructification of Desmarestia as unknown. I was recently engaged in microscopically examining the structure of several specimens of Desmaresti ligulata, when I observed some very minute brown spots on the pinna I had under the microscope, which were resolved by a higher power into small defined tubercles, through the pellucid walls of which I saw assemblages of angular spores of the usual pink colour of the spores of the Florideæ. Further examination showed that these tubercles were pretty freely distributed over both surfaces of the pinna, on the margins as well as on the flat surfaces; those seen on the margins being in profile showed a hemispherical outline, the greater part of which projected beyond the margin. I have no doubt of these tubercles being the fruit, and that they are to be regarded as conceptacula and superficial. I examined pinnæ from two other specimens of D. ligulata, which I had in my possession some years ago, and in both I noticed traces of the same appearance of fruit, but not nearly so distinct as those on my first specimen. In these last the capsules and spores appeared to have discharged their endochrome, and which is very probable, as this genus is very impatient of fresh water, or even exposure to the air, decomposition commencing almost immediately after they are removed from the sea. If the mode of fructification is to guide us in the arrangement of the genera under orders, I conceive Desmarestia should be removed from the order Sporochnaceæ to Dictyotaceæ, as the fructification I have observed in D. ligulata is much more conformable to the latter order than to that of the former. I have not as yet perceived any symptom of fruit either on D. aculeata or D. viridis, but the scattered single spores so very abundant on Mr. Sawer's late important addition

to British Botany, Desmarestia pinnatinervia, cannot but be the fruit of that species. These spores have the same pink colour as those of D. ligulata, but, instead of being in capsules, they appear on every part of the frond like strings of beads or chains. I think it not improbable that young spring plants of the two other species, aculeata and viridis, will reward careful examination by a discovery of their fructification, and I would recommend search to be made among the byssoid fibres with which the young plants are clothed.

"I take this opportunity to exhibit some specimens of Desmarestia pinnatinervia, for which I am under obligation to Mr. William Sawers, of Londonderry, to whom belongs the honour of adding it to the marine Botany of our country. Mr. Sawers sent specimens of his plant to the meeting of the British Association at Hull, and to most of our best algologists, some of whom pronounced it a mere variety of a Laminaria. At length specimens reached Dr. Montagne, of the French Institute, who recognised it as his D. pinnatinervia, a description and figure of which he gave in the 'Annales des Sciences Naturelles' for 1842, vol. xviii. As there are some differences between the appearances of the Spanish plant, as described by Dr. M., and those found by Mr. Sawers, I will refer to a free translation which I have made of the article in the 'Annales.'

"'Is it truly a Desmarestia? That is a question not easily decided in the absence of any fructification. M. Aghardh is inclined to believe it is to that genus we should refer it. This Alga requires careful description, because it has a perfect resemblance to Laminaria debilis, collected on the coast of Corsica by my friend M. Solierol. The only differences which I have found, though essential differences, and which separate our plant from those with which I have compared it are — first, the presence of a well-defined stipe, about four or five millimetres long—secondly, a midrib, which traverses the entire length of the frond, and from which nervures issue to the right and left at the distance of five to ten millimetres from one another, forming with the midrib angles of about 24°. All these nervures, though strongly marked, are of the greatest tenuity. The form of the frond is obovate, fourteen millimetres long by eight in width at the widest part, which is the summit. It has the same delicate tissue as Laminaria debilis. If it is a Desmarestia, as all believe it to be, we must consider the frond as formed by the fusion of the opposing pinnules, which will represent the nervures.'

"The differences which I find between the Spanish plant as described by Dr. Montagne, and the specimens of the Irish plant supplied by Mr. Sawers are:—The Spanish plant is dentated at the margin, obovate, and widest at the summit; Mr. Sawers' specimens are entire at the margin, very slightly waved, lanceolate, and widest about one-fourth of the length of the frond from the base, tapering thence towards the summit. The proportions of length and breadth of the two plants are very dissimilar; however, I am inclined to regard them at present as identical, merely altered by the circumstances of climate. It is singular, that although the figure given in the 'Annales' exhibits an appearance of dots, Dr. Montagne has made no mention of chain-like series of spores, such as are contained in the dots in Mr. Sawers' plants. I imagine that from these spores on our Irish specimens, the exotic ones have them also. By some it has been doubted if the plants taken at Lough Foyle are indigenous to that coast, but have supposed them to be stray waifs, brought from more temperate regions by tides and currents. I cannot subscribe to such ideas from the fact of Mr. Sawers having found fronds of his Desmarestia in tolerable abundance during a large portion of last year (1853) even up to near Christmas, and as Desmarestia undergoes decomposition so very rapidly when dead, I cannot believe it possible those fronds which we see here in excellent preservation, could have been knocking about on the ocean for months: I therefore conclude they grew not far from the spot where Mr. Sawers found them. In conclusion, I would wish to remark on the doubt implied in Dr. Montagne's paper as to the Alga in question being a Desmarestia. The structure certainly agrees with that of D. ligulata. As my specimens were quite dry when they reached me, I could not determine if the single-jointed tube mentioned by Dr. Harvey as traversing the fronds exists in pinnatinervia; should it be found there I have no doubt that it will appear in the nervures and midrib. Although the question is one of much interest to the algologists, and I look forward with expectation that Dr. Harvey will investigate the subject on his return, and clear up existing doubts; I think it very evident that if the pinnatinervia be a Desmarestia, and if the tubercles I have observed on ligulata be the true fruit, then Dr. Harvey will have to construct the genus anew, for the diagnosis does not meet the existing facts."

Mr. Sanders gave very clear explanations of his several microscopical examinations, which he illustrated by handsomely coloured diagrams. He was clearly of opinion that he had detected the spores indicative of a true state of fructification.

The Chairman said that the Society was much indebted to Mr. Sanders for the very interesting statement he had given—interesting, because Mr. Sanders had brought forward an investigation which had hitherto escaped the notice of the scientific. He would be happy to hear any remarks on Mr. Sanders' views.

Mr. Andrews said, that it would be difficult to comment on the excellent statement made by Mr. Sanders, unless the same opportunities of investigation had been afforded that Mr. Sanders so perseveringly followed out. The highest credit was due to Mr. Sanders in submitting views which had not been noticed by any authority in Algology. Statements so put forward had frequently influenced fuller inquiries, which often resulted in the formation of new alliances or genera. In a notice of the discovery of Stenogramme interrupta in Cork harbour by Mr. Isaac Carroll, Dr. Harvey, in this Society, gave a review of the several discoveries and wide distribution of that plant. This genus was established by Dr. Harvey; Agardh, who had constituted it a Delesseria, having mistaken the linear conceptacle for a nerve. Many of our most commonly distributed lichens and mosses are considered rarities when found in fruit, and several species of the most frequent occurrence have never been known to fruit in the British Isles. Desmarestia ligulata is a plant of common occurrence. On the west coast it may be found in the tide-pools of low-water-mark, and to the greatest depth that Algæ can exist. Mr. Andrews trusts that Mr. Sanders may successfully establish the investigations which he has so ably commenced.

Scolopendrium vulgare, var. *marginatum*.

Dr. Kinahan exhibited a plant of Scolopendrium vulgare, *var.* marginatum, found by him at Tinnehinch, county Wicklow, March 2, 1854, its first record as Irish. This variety (first discovered in England by Sir W. C. Trevelyan) is remarkable for having the epidermis on the back of the frond raised into a membranous ridge or tuck, running in a wavy line along it, at some little distance from the edge of the frond; the fronds are scalloped and serrated along their edges, the sori either continuous over the ridge to the edge of the frond or stopping at it, when we find a second set of sori arising outside the hem; or thirdly, the sori are only produced external to the hem: the form is further remarkable for having several modifications—first, that under consideration; secondly, a form named bimarginatum, in

which there is a hem on both faces of the frond; thirdly, a form named supralineum, where the hem exists only on the upper surface of the frond; and fourthly, a form named dubium by its discoverer, G. B. Wollaston, Esq., by whom it was raised from seed, in which we find the free margin running along a frond with multifid apices. In all these forms we find the serrated margin to the fronds, showing that probably the deficiency of the substance at the edge of the frond and of the epidermis, or, taking another view of the case, the irregular growth of the epidermis and of the venules and apices, proceed from the same cause. Dr. Kinahan illustrated his remarks with a series of specimens of the forms mentioned.

Election of Members.

The Chairman then announced the ballot, when Lord Clermont, of Ravensdale Park, and Edward R. Wright, Esq., Trinity College, were elected Members; and Dr. Carte, of the Royal Dublin Society, rejoined the Society. Those who were formerly Members, on being proposed by the Council, can rejoin the Society without payment of the admission-fee. The Meeting then adjourned to the 7th of April.

Botanical Society of Edinburgh.

March 9, 1854.—Professor Balfour, President, in the chair.

Donations.

To the Society's Library and Herbarium:—'Proceedings of the Berwickshire Naturalists' Club,' vol. iii. No. 4, from the Club; specimens of Ophioglossum lusitanicum, *L.* (collected in Guernsey by Mr. Wolsey), from Mr. Moore, Chelsea Botanic Garden.

To the Museum of Economic Botany at the Royal Botanic Garden:—From Dr. Douglas Maclagan; Robert Daw, Esq.; Mr. Waldie; J. M. Hog, Esq., of Newliston; Charles Cowan, Esq.; Mrs. Crichton; Mrs. Dr. Simpson; Dr. Alexander Hunter, of Madras; Dr. Royle; Mr. Bywater (per Mr. Kerr); Dr. Christison; Messrs. Dickson & Turnbull; Humphrey Graham, Esq.; and Messrs. P. Lawson & Son.

Exhibitions.

Dr. Balfour exhibited from Messrs. Lawson, a fine cone of Pinus Sabiniana; also, under the microscope, specimens of porous and true punctated tissue in coal: and he noticed the formation of coal by Sigillarias, and the presence of scalariform tissue in such coal.

Mr. M'Nab exhibited various cut roots of trees which had been transplanted by Mr. M'Glashen's patent apparatus a year ago, and which showed tufts of fibrils varying from 7 or 8 inches to 18 inches in length, produced from the cut extremities.

Dr. Balfour remarked, that Mr. M'Glashen's plan of transplanting had been very successful; and he stated that the cutting of the roots did not appear to operate in arresting the growth, and that the objection urged by some, that the plants, in place of producing wood, were likely, in such circumstances, to exhaust their energies in the production of flowers and fruit, had not been verified by the results so far as already observed. The plan of at once transplanting the trees after their roots were cut, and allowing them to form young rootlets in their permanent position, seemed preferable to the plan of cutting the roots the previous season by trenches to induce the formation of roots, and then running the risk of injuring these by the after removal.

Mr. Evans exhibited Tasmannia aromatica, in flower, from the Experimental Garden.

The following papers were read:—

Pollen of Zamia horrida.

'On the Pollen of Zamia horrida.' By Dr. Balfour. Dr. Balfour drew the attention of the Society to the pollen of some of the Cycadaceæ, more especially that of Zamia horrida. The pollen he stated to be, in its ordinary condition, elliptical, with a groove in one side, and to resemble very much a grain of wheat in appearance. The groove is formed by the folding inwards of the edges of the pollen-grain, which, when fully expanded under the action of water, becomes completely spherical. When water is applied under the microscope to the elliptical pollen-grains of Zamia, the two edges of the groove are seen to unfold and spread out so as to produce the circular grain; when allowed to dry, the grain resumes the elliptical grooved condition. It is perhaps difficult to say whether the elliptical or the spherical

form is to be looked upon as the characteristic one; the elliptical being the dry state of the pollen, while the spherical is the moist condition. The true structure is rendered more apparent by an application of iodine. The pollen of Cycads is stated by many to be angular. This, at all events, is not the form in Zamia horrida. The observations on the latter, he stated to have been made by Mr. George Morris. Specimens of the pollen were shown under the microscope.

Muscology of the East Coast of Fife.

'Notice of the Muscology of the East Coast of Fife.' By the Rev. Thomas Brown. The author offered some observations on the distribution of mosses on the east coast of Scotland, with reference more particularly to such stations as the Sands of Barrie, the Tents' Muir, Elie and Gullane Links, which, although all situated close to the seashore, presented several alpine species. He particularly entered upon a detail of the mosses found by him in the neighbourhood of Elie, which included a variety of Mnium affine, not previously found in fruit in Britain, Bryum dealbatum, Hypnum abietinum, Didymodon inclinatus, Encalypta rhaptocarpa, and other unusual species.

Antheridia of the Rhamneæ.

'Note on the supposed Antheridia of the Rhamneæ.' By J. S. B. Sanderson, M.D. Dr. Sanderson, after a careful examination of the buds of various species of Rhamnus, particularly of R. catharticus, considered that the bodies supposed by Grisebach to be antheridia were not so, and that the club-shaped organs described by him, differed from antheridia in not being developed from a single special mother-cell, in not possessing a central cavity at any period of their growth, and in containing a resinous secretion. He could not detect the "long-tailed globules enclosed in minute spherical cells," described by Grisebach as oscillating in a very lively manner. The paper was illustrated by drawings.

Anatomical Structure of Coniferæ, &c.

'On the Anatomical Structure of Coniferæ and other Gymnogens.' By Mr. G. Lawson. The author remarked that he had recently been engaged in an examination of the minute anatomy of Gymno-

gens, and, after alluding to the peculiarities of structure that had drawn towards these plants the attention of all physiologists, he proceeded more particularly to detail his observations on the anatomy of their wood-cells. The structure and development of the wood-cell had been well-elucidated by Hugo von Mohl, in various papers in the 'Annales des Sciences Naturelles,' and in his work on 'The Vegetable Cell,' but there was one aspect in which the subject had not been so fully viewed as appeared desirable. Mr. Lawson's examinations had been undertaken principally for the purpose of ascertaining in how far the peculiarities in the minute anatomy of the Coniferæ coincided with their general structure, and might be depended upon in the determination of their orders, genera, and species — an inquiry, from which fossil Botany and investigations relative to timber were likely to derive advantage. After detailing the general structure of the wood-cells of Coniferæ, and pointing out peculiarities that occurred in various plants of the order, he described a remarkable modification which had been noticed in the yew, viz. the presence in the wood-cell of what appeared to be a spiral fibre, but which had been shown by Harting to be a connected pellicle with thickened ridges arranged in a spiral manner. Mr. Lawson had found this structure to be by no means so rare as had been supposed, and although principally confined to plants belonging to Taxaceæ, it was stated not to be universal in that order, nor peculiar to it. He had observed it in the following plants:—Cephalotaxus Fortunii C. pedunculata, C. tardiva, Torreya taxifolia, T. nucifera, Taxus baccata, T. canadensis, Podocarpus japonica, P. Koraiana, Abies Douglasii, and Fitzroya patagonica. It also occurred in a specimen of pine-wood from N. California, which presented interesting microscopical characters, but which he had been unable as yet to identify. This structure was not to be confounded with the faint spiral streaks seen under a high power on the secondary membrane of the wood-cells of many Coniferæ. It had been long a question whether true punctated tissue was strictly confined to Gymnogens. A careful examination of Drimys granatensis and other plants had led Mr. Lawson to believe that the disks which occurred in aromatic trees were essentially the same as those of Coniferæ, and indeed accorded in a remarkable manner with those of many Araucariæ and Taxaceæ, in which the central dot was not circular, but formed by two elliptical slits crossing each other. The manner in which this appearance arose was fully explained by a reference to the spiral arrangement of the slits, which also seemed to account for the alternation of the disks in Araucaria. In the determination of fossil

plants and of unknown timbers, Mr. Lawson believed that valuable characters were afforded by the peculiarities of the wood-cell, such as its general size, presence or absence of a spiral tertiary membrane, arrangement of disks (alternate or opposite), their distance from each other in different directions, and whether in single, double, treble, or quadruple rows on each cell; absolute size of the disk, and its breadth as compared with that of the cell; form of disk, whether circular, elliptical, or angular, or a combination of these forms; form of central dot, and (if not circular) direction of the same. The cells of the medullary rays, and the pits in connexion with them, also afford useful marks of distinction. By aid of the above characters, to which many more might be added, Mr. Lawson had been able to mark distinctions between timbers, whose appearances to the naked eye presented no definite characters. It was of great importance, however, in adopting such distinctions, that we should also retain the other means of investigation we possess, and his present attempt was meant not to displace, but to supplement these. He is still engaged in the prosecution of the subject, and expressed an anxiety to obtain additional specimens for examination. The paper was illustrated by drawings and by specimens under the microscope. Specimens of timber were also exhibited, including Wellingtonia gigantea, which Messrs. Veitch, of Chelsea, had kindly sent through Mr. Evans; under the microscope it presented a double row of opposite disks, which, as well as their central dot, were elliptical.

For materials to work upon, Mr. Lawson expressed his great obligations to Professor Balfour, Mr. M'Nab, Mr. Evans, and Mr. P. S. Robertson.

Ophioglossum lusitanicum.

'On Ophioglossum lusitanicum, *Linnæus*.' By Thomas Moore, Esq., F.L.S.

The author remarked:—"The discovery of the Ophioglossum lusitanicum, *L.*, within the politico-geographical limits of Great Britain, so soon after that of Gymnogramma leptophylla, another South European fern, is a fact of much interest; and I have thought that a short account of the plant, drawn up from fresh Guernsey specimens, with which I have been favoured by the discoverer, may be of some interest to those who are studying either our native ferns or our native Flora.

"Ophioglossum lusitanicum, the Portuguese adder's-tongue, is

technically distinguished by the small lanceolate and somewhat fleshy barren branch of its fronds. It is altogether much smaller than the common adder's-tongue, and may be at once known from that species by this difference of size, as well as by its difference of form. The caudex or rhizome forms a short oblong or somewhat fusiform body, half an inch to three-quarters of an inch long, buried beneath the soil, and producing a few coarse spreading roots chiefly from near its upper extremity. At the top it tapers abruptly into a short conical crown. From this crown rises the frond, which attains in the Guernsey specimens from about one and a-half to three inches in height, and is divided above into a barren leafy branch, and a spicate fertile branch. Occasionally, but as it would seem rarely, a barren radical frond of lanceolate form accompanies the two-branched frond. In the latter, the barren branch separates from the fertile spike at about one-third its height. The stipes is slender, smooth, round, and of delicate structure, sheathed at the base by broad taper-pointed scales, which are dilated below and envelope the crown. The barren branch is spreading, lanceolate, narrowing towards but bluntish at the apex, and tapering at the base into a slender petiole; it is from three-fourths of an inch to an inch and a-half long, somewhat hollow along the centre from the elevation of its margins, thick and fleshy in texture when fresh, so that the very slender veins are not seen; when found, by means of maceration, these are, according to Presl, few, very slender, and united in very much elongated areoles. The fertile branch or spike is somewhat taller than the barren branch, and is supported by a footstalk, which is thickened upwards, becoming broad, fleshy, and flattened at the base of the spike. The spike itself is about half-an-inch long, linear, rather widened a little above the base, with a tapering apex, fleshy, and bearing along each margin about six embedded spore-cases, which at length burst transversely.

"The existence of this curious little plant in Guernsey, was first discovered in January of the present year, by Mr. Wolsey, who met with it above the rocks bordering on Petit Bot Bay, in that island. One remarkable feature of the plant is the very early period of the year at which its growth is made. By the middle of January Mr. Wolsey found it to be fully developed, and the fronds no doubt perish early in the spring.

"The range of this Ophioglossum appears to be extensive; for it is recorded to inhabit the sandy coasts, both of Europe and Africa, washed by the Mediterranean Sea, including those of Sardinia, Sicily, Greece, Naples, France, Spain, Portugal, and Algeria; and to extend

to the Canary Islands and Madeira in the Atlantic Ocean. It is not improbable that a diligent search might be rewarded by its discovery in the Western counties of England or in Ireland. Its early development and speedy decay should, however, be borne in mind by those who may undertake the search."

Greenwich Natural-History Club.

Saturday, October 29, 1853.—George Busk, Esq., F.R.S., President, in the chair.

Exhibitions.

Mr. Spurrell exhibited a lacustrine coralline (Plumatella repens), found in the neighbourhood of Bexley. The exact locality from where it was obtained was a pond at East Lodge Gate, Baldwin, Dartford Heath.

The President exhibited a series of leaves of the bramble (*Rubus fruticosus*), which he had received from many of the midland and Southern counties of England, and from Jersey; all of which were affected by a disease almost as general as the potato-disease. In some counties, as Suffolk, not a leaf but was more or less affected. The cause of this disease was a microscopic fungus, the Erigma (Phragmidium) bulbosum of Berkeley; and when magnified it exhibited the appearance of a pedicel, supporting sometimes three, sometimes four (never more than four) sporidia, surmounted by a kind of button, representing an imperfect sporidium. The specimens of Erigma found on Rosæ, and examined by Mr. Currey, generally possessed eight sporidia. It is worthy of remark, that the Herefordshire brambles were less affected by the disease than any others.

November 26, 1853.—George Busk, Esq., F.R.S., President, in the chair.

A paper was read intituled, 'A Comparison between the Quadrumana of the New and Old Worlds, with especial reference to their Nasal Peculiarities,' by Cuthbert Collingwood, M.A., F.L.S., Hon. Sec.

Fungi of the Neighbourhood of Greenwich.

A paper was also read by Fred. Currey, Esq., M.A., on 'The Fungi of the Neighbourhood of Greenwich.'

The author commenced by observing, that as it would not be practicable to enter into details of all the different species, he had considered that the most interesting way of treating the subject would be to select some of the most striking members of the tribe, and to illustrate his observations with drawings. Mr. Currey noticed the different orders into which Fungi are divided, according to the latest English authorities; and mentioned the distinguishing features of each order. He stated that the plants belonging to three out of the six orders would not require much observation, being those Fungi popularly known as moulds and blights, which are universal in their distribution, and can hardly be considered as belonging to any particular district. In the genus Agaricus, Mr. Currey called attention, amongst others, to Agaricus muscarius, which is remarkable for its great beauty, as well as for its poisonous and intoxicating qualities; and to A. rutilans, which is interesting from the beauty of its colour, and peculiar from its habit of disappearing for a series of years from its ordinary places of growth. He mentioned also Agaricus rubescens, A. ostreatus, A. torminosus, and several others, of which drawings were exhibited. He next referred to the genus Polyporus, of which several species are to be found in the neighbourhood; and produced to the Society a specimen of Polyporus ulmarius, of an usually large size, which measured 2 feet across, and weighed 31 pounds. Of the Clavariæ, Mr. Currey stated the following to belong to the district; namely, C. inæqualis, C. coralloides, C. cristata, and C. rugosa. He mentioned C. coralloides as being a rare plant, of a pure white colour, resembling branched coral. This genus concluded the order of the Hymenomycetes. Amongst the Gasteromycetes, Mr. Currey mentioned some of Lycoperdons, the Phallus impudicus, and several other genera, too numerous to be mentioned within the limits of an abstract. He directed particular attention to two species of earth-stars, or Geaster, namely, Geaster fornicatus and G. coliformis; the former of which, he stated, was to be found at Hayes; and the latter, in the lane leading from Crayford to Bexley. Under the third order of the Ascomycetes, Mr. Currey referred to Helvella lacunosa and H. elastica, and mentioned that they were both to be found in the neighbourhood of Eltham, the latter being a rare plant. He

entered, also, into some particulars relative to the family of the Geoglossæ, or earth's-tongues; but was prevented by the lateness of the hour from taking notice of the genus Peziza, which he had intended to have done: and after briefly adverting to a species of Exidia, and to a drawing of some plants of Phagmidium bulbosum, he brought this part of his paper to a conclusion.

Saturday, December 17, 1853.—George Busk, Esq., F.R.S., President, in the chair.

Fungi of the Neighbourhood of Greenwich.

Mr. Currey concluded his paper on 'The Fungi of the Neighbourhood.'

The author commenced by correcting a statement in his previous paper, with respect to a supposed new Agaric, since ascertained to be A. campanella. He then called attention to a drawing of a very fine specimen of A. conchatus, which had been found on a tree in Lee Park; and pointed out its peculiar mode of growth, and the nature of the tomentose stem, which strongly resembles coarse white velvet. He then mentioned some specimens of Agaricus personatus, found growing gregariously (almost cæspitosely) upon a rubbish-heap, attached to the *débris* of the leaves of a cedar-tree, the habitat being unusual, as A. personatus is generally found growing in meadows, in rings. Some remarks were added upon the difference between the early and late stages of growth of A. aureus; and the following Agarics were added to those previously stated to belong to the district; *viz.*, A. nudus, A. lateritius, A. sulphureus, and A. radicatus. The author then proceeded to discuss the genus Peziza, with reference, amongst other things, to the position of that genus in the natural arrangements of the family of Fungi. The following, amongst many others, were mentioned as appertaining to the district; *viz.*, Peziza calycina, P. scutellata, P. cochleata, P. macropus, P. aurantia, P. succosa, P. humosa, and P. hemispherica. The author then made some remarks on the difference in structure of certain species of Sphæria, illustrating them with diagrams of the fructification of S. militaris and S. digitata. Of the tribe Tremellini, Exidia recisa, Tremella mesenterica, and Tremella intumescens were stated to grow in the neighbourhood. The author called attention to an interesting fungus which he had lately met with at Eltham, *viz.*, Cyphella muscicola; and

made some observations upon the germination of Phragmidia, and the nature of the fructification of the genus Thelephora, with regard to certain bodies similar to asci, which, he stated, are to be found at an early stage of growth. The author concluded with some remarks upon the different species of Uredines; he expressed some doubts as to the real difference of the numerous named species of that genus, stating that he had himself found Uredo Euphorbiæ growing upon the culms and leaves of Alopecurus agrestis.

Saturday, January 28th, 1854.—George Busk, Esq., F.R.S., President, in the chair.

Exhibitions.

Mr. Glaisher exhibited several very beautiful photographic copies of the crystals of snow, produced at the Royal Observatory. He stated that he had counted upwards of fifty compound forms.

The President exhibited a series of excellent photographs of microscopic objects, principally zoophytes, obtained by means of the collodion process from negatives on glass, by gas-light. The average time of exposure was nine or ten minutes.

Mr. Currey exhibited a very beautifully prepared collection of Algæ, obtained by Mr. Tuwanowicz, at Hastings; accompanied by a communication from the same gentleman, descriptive of his method of preserving them, which is as follows:—

Method of Preserving Algæ.

"Algæ should be gathered on rocks, either very early in the morning, or when the sun is considerably below the meridian. If gathered amongst the rejectamenta after a storm, absolutely *very* early, for the sun would scorch them, and the finer and more delicate ramuli are distorted by heat and matted together. An oil-skin bag, or, still better, a bottle with a large neck, is necessary for collecting Algæ; using therefore the latter, fill up part of it with sea-water and deposit your discoveries in it. When at home, first cleanse them in one or two washes of sea-water, then dislodge all parasites as far as possible with small scissors, except those minute Algæ which must be left parasitically upon another plant. The coarser Algæ, as Fuci, Halidrys, &c., require to be kept in fresh water for several days to deprive them of the salt; but all the minute or delicate ones, such as

Callithamnia, require to be only a few minutes in fresh water; and the genus Griffithsia cannot endure fresh water at all, but when immersed in it, dyes it carmine, the plant itself being deprived of its colour. Such plants should be laid out in clean sea-water, and as speedily as possible after being gathered.

"Stout cream laid, or hotpressed drawing-paper, of uniform size, saturated with sweet oil, by the aid of a broad camel's-hair brush, should be used. Lay the pieces one over the other and repeat the saturation; then bake them in an oven not overheated, and it is best to leave them for one night or longer, until they are well baked. Float out the specimen in fresh water in a broad shallow dish, white bottomed, and without any pattern in colours, and bring the oiled paper underneath the seaweed, and withdraw it carefully with the plant from the water, so as to leave the natural appearance of its ramuli. It is best to withdraw it by one corner, and to turn it almost round extremely gently, sometimes assisting the development with the point of a long pen. Lay the paper thus withdrawn on a very slightly inclined board, in order to allow the water to drain off; and in a few minutes, or even sooner, when the water has escaped, lay the oiled paper with the specimen upon it on white blotting-paper folded in quarto. Spread over the specimen most carefully a piece of old cambric, or fine muslin, or very fine lawn, and on this lay more blotting-paper, and so on. Over all this place a heavy book or weight to press them; but remember to place less weight on the finer than on the coarser seaweeds. Change the blotting-paper at least every six or eight hours, with great care not to disturb the coverings of the specimens, else it would spoil their arrangement. Each time the blotting-paper becomes damp, it must be well dried and pressed smooth before being used again. After the third change of the blotting-paper, you may remove the muslin or cambric with the specimen already dried, if a delicate one (coarse ones require six or seven changes), and again place it between dry blotting-paper, laying aside the oiled paper to be dried for future use. Next, remove the specimen most carefully from the muslin or cambric, and fix it by means of narrow strips of paper to the cream laid paper, adding on the outside the name, class, order, family, &c.

"At first you require to be very careful, but experience will familiarize you with the proceedings. This description is derived from my own long experience, having tried many plans and found none better than the above. Some of the finer and rather gelatinous plants are difficult to remove even from the oiled paper, and in this

manner I have lost many hundreds, among them some of the rarest; it is best therefore to lay out such plants at once on pieces of cream laid paper, cut rather larger than the plants, and covering them with muslin or cambric, the specimens will adhere firmly to the paper, and when dried may be fixed with gum by the corners on to the quarto cream laid paper. Confervæ and Cladophoræ require to be laid out as soon as possible, otherwise they lose their characteristics, particularly by the relaxation of their ramuli, and the brilliancy of their colours will turn to yellowish."—*C. C.*

The Phytological Club,
(In connexion with the Pharmaceutical Society.)

First Annual Meeting.— Wednesday, January 11, 1854.— Robert Bentley, Esq., F.L.S., President, in the chair.

Donations.

Donations of ferns from Mr. Daniel Hanbury, and of ergotised grasses and specimens of Hymenophyllum Tunbridgense from Mr. Blyth, were announced.

Report of the Committee.

The following Report was read by the Secretary :—

"In presenting their First Annual Report the Committee have to congratulate the Members upon the flourishing and prosperous condition of the Phytological Club.

"The support and countenance it was received prove that the objects for which it was established commend themselves to pharmaceutists, and that an association of this kind is desirable in connexion with the Pharmaceutical Society.

"The objects contemplated at the formation of the Club have been constantly kept in view. The monthly meetings have been regularly held, at which many interesting papers and communications have been read, and instructive discussions have taken place upon them. These have been from time to time reported in the 'Pharmaceutical Journal.' A Branch Association has been formed at Worcester, and the Committee hear of others in the course of formation.

"The list of Members, which numbers seventy-five, is as large as the most sanguine could expect, when it is considered that the Club has only completed the first year of its existence, and that no great efforts have been made to induce Members to join. The Committee, therefore, confidently believe that during the ensuing year the number of Members will be considerably increased.

"The financial condition of the Club is also satisfactory. After the current expenses of the year have been met, a balance of £10 10*s.* 3*d.* remains in the hands of the Treasurer.

"The formation of the Herbarium has not been forgotten. 1700 specimens have been presented, 350 of which form the Herbarium of the Club, and will represent about the number of species. 1350 specimens remain in the hands of the Curators for exchange or distribution among the Members. These duplicates will be distributed among those Members who make application for them to the Curators; those who have contributed specimens having a prior claim.

"In concluding their Report, the Committee would press on the Members the desirability of enlisting new Members, and of encouraging a spirit of observation and inquiry on subjects of botanical interest. By so doing the practical value of the Club will be increased, and each succeeding Annual Report will afford greater cause for congratulation."

Election of Officers.

The following Officers were elected for 1854:—President: Robert Bentley, Esq., F.L.S. and Professor of Botany, &c. Vice-Presidents: Jacob Bell, Esq., F.L.S., Henry Deane, Esq., President Pharm. Soc., T. N. R. Morson, Esq., F.L.S., T. Redwood, Esq., Ph.D. and Professor of Chemistry and Pharmacy, P. Squire, Esq., M.R.I. Treasurer: Daniel Hanbury, Esq. Curators: Mr. J. C. Braithwaite and Mr. Edmund Greaves. Other Members of Committee: Mr. Allchin, Mr. Greenish, Mr. W. Matthews, Mr. Thomas, Mr. Walker, Mr. Williamson. Honorary Secretary: Lindsey Blyth.

THE PHYTOLOGIST CLUB.

One Hundred and Fifty-fifth Sitting. — *Saturday, March* 25, 1854.—MR. NEWMAN, President, in the chair.

The President read the following communications :—

French Locality for Ulex australis.

"I do not know if any of your correspondents have indicated the precise localities of Ulex australis (U. provincialis, *Lois.*), in the South-east of France. Mr. Babington, in the 'Annals,' some years since, mentioned that he received it from Marseilles, and indicated what he considered the diagnostic marks between U. australis and U. Europæus. I spent three or four days lately in Marseilles, and brought away a few specimens of U. australis. It is first found between Avignon and Marseilles, about twenty-five miles from the latter place, growing abundantly in open, exposed places near the sea, and has there very much the facies of U. Europæus; it is found in suitable localities, at intervals, all the remaining distance to Marseilles. Beyond Marseilles, on the road to Nice, it first occurs very sparingly within five miles of the town, increasing in abundance as far as Brignolles, and about twelve or fifteen miles beyond Brignolles appeared to cease altogether. Here it grows on rocks &c. by the roadside, and its facies is much more characteristic than between Avignon and Marseilles. It is slenderer and taller than E. Europæus; the flowers smaller and more numerous. On a closer examination, the stamina and pistil are much more delicate and slender, the bracts, or scales at the base of the calyx, much smaller and less highly coloured, than in Europæus. As to the calycine teeth, they are quite as well marked in my specimens of U. Europæus as in U. australis, and as in the figure of the latter plant given by Loiseleur; although he separately and specially represents the calyx, with its teeth, as in some degree characteristic of his U. provincialis. In U. Europæus, the flowers spring quite from the axils of the branchlets; in U. australis, they are not axillary, but grow from the branchlet, about a line or more from its junction with the main stem. The Ulex was in full flower in January, defying the piercing mistral; though it does not grow on the exposed rock to the left of the bay overloking the quarantine island, Chateau d'If, &c."—*Charles Prentice; Cheltenham, March* 4, 1854.

Plants at Nice.

"At Nice, though rather more to the North, the weather was warmer, and vegetation further advanced than about Marseilles. I noticed in full flower, at the beginning of February, Anemone hortensis, Ranunculus Ficaria (very large), Thlaspi perfoliatum, Globularia vulgaris,

Rhamnus alaternus, Cytisus sp., Satureia capitata, Centaurea paniculata, *L.*, Rosmarinus officinalis, Euphorbia dendroides, Andropogon hirtus, Geranium molle and G. rotundifolium, and Erodium Bocconi. Grammitis Ceterach was the most abundant fern, though Adiantum Capillus-Veneris is nearly as frequent. The sea-cliffs are too dry to be rich in ferns, and I noticed there only Asplenium Trichomanes and A. Ruta-muraria, and Aspidium glandulosum (rare). Asplenium Trichomanes and A. Adiantum-nigrum are hardly so luxuriant near Nice as we see them in South Devon. The terrace-cultivation of the olive-orchards has very much injured the natural vegetation of the low but picturesque hills close to the town. I had not time to penetrate to the loftier summits bounding the landward horizon of Nice, and which, covered with snow in winter, would, from their greater humidity, furnish more cryptogamic plants than the hills near the town. Gymnostomum tortile, Physcomitrium curvisetum (rare, on the sea-cliffs only), Tortula fallax and T. rigida, Grimmia pulvinata and G. trichophylla, Dicranum varium, Hypnum striatulum, *Spruce*, and H. molluscum, Mnium affine and M. punctatum were all the mosses I noticed in fructification."—*Id.*

Gymnogramma leptophylla.

"In my note (Phytol. iv. 1096) respecting the Gymnogramma, I stated that 'it doubtless will be found in other localities, as the climate must nearly approach that of the South of France, and of Italy, where the Gymnogramma abounds.' I have just received a letter from my valued correspondent, Mr. Piquet, a portion of which I transcribe. 'I have now the Gymnogramma growing under a glass shade. It is full five inches high, and very beautiful. I had never seen anything like it; in fact, it is finer than the specimen you showed me from Madeira. It has been found in two or three other localities of late; so that there is not much chance now of its being all taken away.'"—*N. B. Ward; Clapham; March* 6, 1854.

Mr. Newman said, that Mr. Ward also noticed a supposed new fern, found in Jersey, by Mr. Piquet, who had obligingly sent him (Mr. Newman) specimens and much information. The subject was still in the course of investigation.

Contributions towards a History of a British Botrychium, considered as a distinct Species, and as entitled to a place in the British Flora. By EDWARD NEWMAN.

As on a late occasion (Phytol. v. 36), so on the present, my object is rather to invite attention to a neglected plant, and to solicit information respecting it, than to express, much less to enforce, any peculiar views of my own. I extremely regret the paucity of materials collected in a field which seems to promise such an abundant harvest. It appears that there are at least six species of Botrychium inhabiting Europe, under the same parallel as own Scottish Highlands, and also under a parity of climatal and geological conditions. There can be little doubt that these will be eventually added to the British Flora: but, as an excuse for their having been overlooked, it may be urged, and perhaps with justice, that the Botrychiums are remarkably inconstant in their appearance, and evanescent in their duration; and therefore that the man who meets with them is often rather fortunate than skilful. There is something yet unexplained in the history of the species of Botrychium, in common with that of the natural order to which they belong. They have all the appearance, and some of the characters, of root-parasites: every fact connected with their succulent nature, brief duration, capricious appearance and disappearance, and place of growth, suggests such a conclusion. Who ever has found a Botrychium except among herbage?—who has ever succeeded in cultivating a Botrychium except he removed to his fernery the undisturbed sod which afforded it a nidus? It is true that we want better evidence than this: we want the working out of the problem from facts, and not from probabilities: and I heartily wish that those botanists who have the leisure would pursue the interesting subject of root-parasitism, in this and other instances where we are still completely in the dark.

Two European Botrychiums have long been known to inhabit this country. Their *nativity*, so to speak, has never been called in question; but a fashion has prevailed of regarding them as identical, and of ignoring the very existence of a second name. This is a way of solving a difficult problem that appears to me rather superficial than satisfactory. The proper botanical standing of the blue Anagallis was formerly, and perhaps is still, a moot question; but no one has hitherto ventured to deny its existence. Let us, then, acknowledge

the existence of a deltoid Botrychium, and glance slightly at its history.

1. Ray, &c.

"Lunariam minorem ramosam, & Lunariam min. fol. dissectis Westmorland. *D. Lawson* hujus plantæ varietates esse; non distinctas species opinatur. (*D. Doody Syn. II. App.* 340. Lunariam minorem foliis dissectis revera distinctam speciem vult, cum segmenta seu lunulæ non solum eminenter sint sectæ, sed planta etiam elatior sit & botrus racemosior. Est Lunaria botrytis minor pinnulis laciniatis, in Borealibus nostris Pluk. Alm. 288. *Mr. Doody* received it from Sir *Th Willughby*, but hath since seen it several times gathered by our Herb-women)."—*Raii Syn.* 129.

From this passage I draw the following conclusions :—

1st. That Ray supposed there were two British species of Botrychium distinct from lunaria.

2nd. That Mr. Lawson thought them both varieties of lunaria.

3rd. That Dillenius believed one of them, described as with *foliis dissectis*, to be a distinct species.

4th. That this species, or supposed species, was found by or known to Ray, Lawson, Doody, Willughby, and the herb-women.

2. Swartz.

In his 'Synopsis Filicum,' dated 1806, Swartz describes a new species of European Botrychium, under name of Botrychium rutaceum.

"B. frondibus subsolitariis bipinnatis, pinnis ovatis, incisis."—*Syn. Fil.* 171.

He cites "Breyn. Cent. t. 94," as representing his plant.

3. Willdenow.

In his 'Species Plantarum,' dated 1810, Willdenow also describes a Botrychium rutaceum.

"B. scapo superne unifrondoso, fronde bipinnatifida laciniis emarginato- bi- seu tridentatis obtusis. W."

He cites Mor. Hist. iii. p. 594, sec. 14, t. 5, f. 2, 3, as representing his plant.

Side by side with Botrychium rutaceum, Willdenow describes a second species; and this was also known to the pre-Linnean botanists. This second species is called B. matricarioides; and from Willdenow's days downwards the two names have been almost inextricably involved.

4. Smith, &c.

In his 'English Flora,' Sir J. E. Smith cites all these authors, and makes the plant in question var. δ. of his Botrychium lunaria.

"δ. L. minor, foliis dissectis. *Raii Syn.* 129. L. racemosa minor, matricariæ folio. *Breyn. Cent.* t. 94. *Moris.* v. 3. 594. sect. 14, t. 5. f. 3. Botrychium rutaceum, *Sw. Syn. Fil.* 171. *Willd. Sp. Pl.* v. 5. 62."—*E. F.* iv. 328.

Here we have the B. rutaceum of Europe identified as a British plant, but, although retained as a variety, advisedly rejected as a species, because, although "found occasionally intermixed here and there with the plant in its proper or common form; yet never, as far as" the author "could learn, so *numerously distinct* as to have the appearance of a different species."

It would seem, from this passage, that paucity of individuals was the *only* inducing cause with Sir J. E. Smith for rejecting Botrychium rutaceum as a British plant; but still he retained it as a variety. The learned authors of the 6th edition of the 'British Flora,' and the very careful author of the 'Manual,' go a step further: they ignore the existence of such a plant.

5. Braun, &c.

Prof. Al. Braun, in the 2nd edition of Koch's 'Synopsis,' has been at great pains to make the synonymy intelligible; but he gives the plants two new names, matricariæfolium and rutæfolium; and, what seems still more unfortunate, his matricariæfolium = Willdenow's rutaceum; and his rutæfolium = Willdenow's matricarioides. Doll, in his 'Rhenish Flora,' adopts this change.

6. Ledebour.

Ledebour, in his 'Flora Rossica,' rejects the new names, and restores the old ones; but makes the rutaceum of Swartz synonymous with the matricarioides of Willdenow. In support of this view he offers no evidence; and were this transposition of the synonyme really required, surely the identification of the rutaceum of Swartz with the matricarioides of Willdenow would necessitate the adoption of Swartz's name for that plant, since it has a priority of four years. Seeing, however, that the characters and synonymes are drawn up with great care, and exhibit all that has been done on the continent for two plants, which, whether species or varieties, will in all probabi-

lity ere long hold a station in the British Flora, I shall transfer them, without hesitation, to the pages of the 'Phytologist.'

"2. B. *rutaceum* (*Willd. Sp. Pl.* v. 62. excl. Syn. Swartz.) fronde sterili solitaria oblonga longitudine sua duplo triplove angustiore petiolo frondis fertilis ad medium usque v. altius adnata pinnatipartita: pinnis ovatis, v. oblongo-lanceolatis pinnatifido lobatis: lobis 2-3 crenatis obtusis.

B. rutaceum, *Mart. Fl. Mosq.* p. 183.

B. Lunaria β., *Fries, Novit.* ed. 1. p. 38; ed. 2, p. 289?; *Wahlenb. Fl. Suec.* p. 681; *Fries, Summa Veget. Scand.* p. 83? *Rupr. in Beitr.* 2. *Pflanzenk. d. Russ.* R. iii. p. 33, iv. p. 92.

B. Lunaria forma rutacea, *Less. in Linnæa*, ix. p. 212.

B. Lunaria, *Kaulf. Enum. Fil.* p. 24 partim.

B. matricariæfolium, *Al. Braun in Koch Syn.* ed. 2, p. 972; *Fries, Summa Veget. Scand.* p. 252.

Osmunda lanceolata, *S. G. Gmel.* in *Nov. Comment. Acad. Petrop.* xii. p. 516, t. 11, f. 2.

Lunaria vulgaris varietas: Lunaria foliis Adianthi Breynii. *Buxb. in Comment. Acad. Petropol.* iii. p. 271.

β. *tripartitum:* fronde sterili tripartita: lacinia media profunde trifida; omnibus ovato-lanceolatis serrato-incisis: lacinulis obtusis.

3. B. *matricarioides* (*Willd. Sp. Pl.* v. 62) fronde solitaria petiolata, petiolo basin frondis sterilis subvaginante; lamina triangulari transverse latiori trisecta: segmentis primariis pinnatisectis; secundariis inferioribus 2-3-v. pinnatipartitis: superioribus inciso-crenatis: laciniis rotundatis crenulatis.

B. matricarioides, *Fries, Novit.* ed. 2, p. 288. Ej. *Summa Veget. Scandin.* p. 83, 252. *Turcz. Cat. Baikal.* No. 1339.

B. rutaceum, *Swartz, Syn. Fil.* p. 171. *Wahlenb. Fl. suec.* p. 681; *Rupr. in Beitr.* z. *Pflenzenk. d. Russ. R.* iii. p. 33.

B. Matricariæ, *Spreng. Syst. Veg.* iv. p. 23. *Eichw. Skisse*, p. 114. *Weim. Fl. Petropol.* p. 105.

B. rutæfolium, *Al. Braun* in *Koch Syn.* ed. 2, p. 972.

Osmunda Lunaria var Böckeana. *L. Amœn. Acad.* viii. p. 105.

Osmunda Matricariæ, *Schrank; Baier. Fl.* ii. p. 419."—*Ledebour, Fl. Rossica*, xiv. 505.

Mr. Woods, in his 'Tourist's Flora,' has given the two new or modified names, thus: his matricarifolium = rutaceum, *Willd.*, and his rutifolium = matricarioides, *Willd.*

Botrychium rutaceum of Swartz.

Of species, or supposed species, of deltoid Botrychium inhabiting this country, I will here consider we have but one; and of this a fair representation is given above. With this plant, as British, Ray, Lawson, Doody, Dillenius, and Smith were familiar: the last-named botanist identified it with the B. rutaceum of Swartz, and abundantly proves his knowledge of the plant by his reference to figures. Mr. Cruickshank found three specimens of it on the sands of Barry, near Dundee, in August, 1839; one of them, evidently a monstrosity, is figured in 'British Ferns,' p. 348. Mr. Cruickshank particularly states that no specimens of Botrychium lunaria were found near them.

The second plant, which I am prepared, with Ledebour, to call matricarioides, and of the existence of which in this country there is no evidence, appears to me to be perfectly distinct as a species. In rutaceum, *Willd.*, the stipes, as in lunaria, ascends *undivided until near its summit;* it then throws off the barren branch, which is almost sessile, deltoid, and *pinnate*, exhibiting no tendency towards a tripartite division, but the pinnæ *regularly decreasing in length*, and being sublinear or subclavate, *rather broader near the apex than at the base.* In matricarioides, *Willd.*, the stipes is *divided almost at its base*, and below the surface of the ground, the barren branch appearing as a root-leaf, and its base evidently sheathing the base of

the fertile branch, the stipes, or petiole, or scape of which is very long. The barren branch, or leaf, also differs in a marked manner from that of rutaceum; its petiole is longer than the leaf; it is distinctly *tripartite*, its divisions being stipitate and somewhat *tripartite*. Comparing it primary lateral divisions with the first pair of pinnæ in rutaceum, they are *deltoid* instead of *linear*, *broader* at the base instead of *narrower*, *distinctly petiolate* instead of *subsessile*. These differences are constant, no intermediate states occurring.

We have now only to ask on what evidence B. rutaceum is united to B. lunaria; and the reply is, the paucity of specimens. This seems plausible, but insufficient. The same argument would erase, and perhaps with propriety, Asplenium germanicum from the list of species. But it should be shown that the deltoid or trigonate frond of rutaceum is a modification of the linear frond of lunaria; and it should also be shown how the elongate pinnæ of rutaceum, with their evident median axis, are modifications of the flabellate pinnæ of lunaria, which have no median axis. To myself, there appears no mode of explaining the phenomenon; for those examples of lunaria which show a disposition to *greater* division retain the flabelliform outline, but become digitate; while those which evince an opposite tendency merely become more entire on the margin. Information is earnestly solicited.

Edward Newman.

Proceedings of Societies, &c.

The Phytological Club,
(In connexion with the Pharmaceutical Society.)

March 8, 1854.—Robert Bentley, Esq., F.L.S., President, in the chair.

Several new members were elected, and a list of candidates read and proposed.

Relation of Meteorology to Botany.

The Secretary made some observations on the Relation of Meteorology to Botany. He thought the weather was a very proper subject for discussion in an association formed for the purpose of promoting the study of Botany. Man was sensitively alive to every modification

of the weather, but he could protect himself by artificial means from its extreme influences—whilst plants were exposed to all its changes —and it was of great importance to become acquainted with the causes that so materially affected their constitution. He then, by the aid of maps and diagrams, pointed out the principles on which the science of meteorology is founded, and gave a description of the physical and chemical constitution of the atmosphere, showing the two great currents that are constantly flowing from the equator to the poles set up by the action of the sun on the surface of the earth between the tropics—which, modified by the diurnal and annual rotation of the earth, and by the relative distribution of the sea and land, gave rise to every variety of climate. Although the whole of organic nature is dependent on these phenomena, yet meteorology and botany had been cultivated as distinct sciences, and it had been reserved to M. Humboldt to draw out a general plan, indicating the direct bearing that climate had on vegetation. He divided each hemisphere into seven belts or zones of climate, each of which contained species peculiar to itself. The vegetation of mountains presents on a small scale the image of that of the earth considered as a whole. The annual mean temperature of a place is not, however, the only circumstance which determines its peculiar vegetation. The effects of the lowest temperature of winter, as well as the highest temperature of summer, have also to be taken into consideration. Besides the vivifying influence of heat, the chemical action of the sun's rays of light modify many of the constituents of a plant. Lastly, he drew attention to the conditions of the atmosphere which appeared to affect the health of plants. Blights in the wheat and in the potato, and mildew on the grape, had appeared simultaneously with great electrical disturbances of the atmosphere; but although the subject was involved in great obscurity a more ear nest spirit of observation was at present awakened, and no doubt valuable resuts would follow.

A few Remarks on Cotyledon Umbilicus.

A communication from Mr. Gissing, of Worcester, was then read, entitled ' A few Remarks on Cotyledon Umbilicus.'

" I believe that a work on the popular uses of British plants among the lower classes of the English people, would prove both useful and instructive. Among other classes, it would, I think, exhibit the fact that in many of the new remedies introduced into medicine, the practice of the village doctress has furnished the first hint to the supposed discoverer of new virtues in various plants.

"The one plant, or 'herb' as all wild plants are called by the common people, that I have now more particularly in view, is Cotyledon Umbilicus. This plant, it is well known, is very common in Devonshire, Somersetshire, and the South-west of England, as well as on the rocks in Wales and the counties bordering thereon.

"In the former counties it grows chiefly on banks, and attains a much greater height than in its more rocky habitats. From Somersetshire I have seen specimens, the flower-stalks of which were two feet or more high, but plants growing in more mountainous situations I have seldom seen exceed eight or ten inches. Perhaps I may say a few words here upon the shape of the leaf of Cotyledon Umbilicus. In Monmouthshire, Gloucestershire, and Worcestershire I have gathered plants with some of the root-leaves kidney-shaped, and others spathulate, and not peltate as is usual. I am unable to state whether these leaves would afterwards have assumed the peltate form; but from the fact of several of the other leaves on these plants having their stalks at various distances from their edges, I thought there was a probability of their having been originally reniform or spathulate. I know it is by no means a general rule for the leaf-stalks to be central, but the two circumstances united in one plant caused the supposition that the peltate leaf might be a development of an earlier form. I name this fact because I have never before seen it noticed; if it be general, it is worthy of remark. The leaves of the flower-stalk, I know, are generally nearly reniform, but the leaves I have spoken of were growing long before the flower-stalk made its appearance.

"One of the common names of Cotyledon Umbilicus is kidney-wort. Now we know pretty certainly that the other vulgar names, penny-wort and navel-wort, are given from the shape of the leaves. Did the person who added to these names kidney-wort do so for the same reason, or from any supposed curative power? Most likely the latter; but still, bearing in mind the leaves I have spoken of, there is a possibility in favour of the former.

"Respecting the medicinal use of Cotyledon Umbilicus, it is well known to most chemists and druggists, that Mr. Salter, of Poole, introduced it a few years since as a cure for epilepsy, since which time it has been used, although I believe to only a limited extent, amongst medical men.

"In Monmouthshire and Herefordshire I found, on inquiry, that the leaves were taken for urinal obstructions and 'fits;' in Lancashire, amongst other complaints, they are likewise taken for 'fits.' In Herefordshire I find they are used for corns and warts; in Worcester-

shire they are used for the same purpose; hence they are called 'corn-leaves.' They are likewise used here to make a cooling ointment, and their juice is expressed and mixed with cream as a cooling lotion for sore faces or chaps in children; in the same manner as the juice of the houseleek (*Sempervivum tectorum*).

"Whether Mr. Salter knew of its use amongst the common people for 'fits,' and examined for what kind of 'fits' it was used, and found it to be epilepsy, of course I am unable to say, but I have no doubt it was used for what the people call 'fits,' very many years before Mr. Salter introduced it into the regular practice of medicine. For it is most unlikely that the people should have recently adopted it, as they generally are violently opposed to all innovations upon their time-honoured customs. Witness the feeling still prevalent in many parts against vaccination. The word of a village doctress is much more powerful amongst the ignorant peasantry than that of the qualified practitioner. She is a remnant of a bygone age, and I doubt not, as surgeons penetrate more into remote districts, the rising generation will totally discard the only medical adviser to their forefathers. The doctress commenced her practice when it was almost the only mode of treatment; and when, if surgeons differed from her, it was only to prescribe more absurd and disgusting remedies; she kept it when medical men came to be comparatively frequent; and her 'occupation' will only be fully 'gone,' when the class that now constitutes her patients has become intelligent enough to prefer science to quackery.

"Ray says, that the root and leaves of Cotyledon Umbilicus (or Umbilicus Veneris, as it was then named) were used for erysipelas, &c., and refers to Dioscorides and Galen. Dr. Hill, in his 'Family Herbal,' gives it as a general cooling medicine, internally and externally. In the last edition of Gray's 'Supplement to the Pharmacopœias,' it is said to be used in the same manner; and in Meyrick's 'Family Herbal' it is given as cooling and diuretic, and good for burns; but in none of these are 'fits' named. Whether the authors disbelieved the utility of the plant in these diseases, or whether they were ignorant of its use in such cases, I cannot tell. It is likewise very difficult to determine what ignorant people mean by the term 'fits;' apoplexy, paralysis, hysteria, and epilepsy are all 'fits' with them: they have no discriminating eye for the different symptoms that denote the different kinds of 'fits.'

"The only notice I have seen of Cotyledon Umbilicus being used in any of the diseases just named, is in the 'Pharmaceutical Journal'

for 1849, where Mr. Ince observes, that it has long been a popular remedy in 'hysteria.'

"Anything that alleviates the sufferings of humanity should be hailed with satisfaction, and whether Mr. Salter has taken a leaf from the prescription-book of the village doctress, or not, is of but little consequence, so long as it is useful, but in that case it is not a new medicine.

"I have brought forward these remarks, thinking they may induce others, who, perhaps, possess greater advantages than myself, to examine the subject of the local uses and names of British plants.

"In examining the subject, they might eliminate all that is worthless, and adopt whatever they found worthy of support. In doing this, they will be just as much assisting truth and progress, as if they were engaged in some higher and more ostentatious branch of the sciences."

The President said that in his opinion, whether Mr. Salter was the original discoverer of the virtues of Cotyledon Umbilicus in epilepsy, or only the introducer of it into the regular practice of medicine, he was equally entitled to the thanks of the community at large for any benefits that might arise from its use, although, as far as his own experience went, he thought that the value of this remedy in epilepsy had been much overrated. The President also stated that he was very glad to find, from the interesting paper just read, that the local uses of our indigenous plants had begun to excite the attention of the members of the Phytological Club; as this was one of the prominent objects contemplated at its establishment, and one also which he had on several occasions impressed the importance of upon the members, he hoped therefore that this paper would soon be followed by others on similar subjects. Mr. Bentley also called attention to that part of the paper referring to the probability of the extract of Cotyledon Umbilicus, prepared from plants from different habitats, possessing somewhat different characters. He thought that this was very likely to be the case, as he believed that climate, soil, &c., had far more influence in modifying the properties of plants than was generally supposed, and from the importance of the bearing of this subject upon pharmaceutists, who had continually to make use of plants and their products in the preparation of various medicinal compounds, he urged the necessity of a thorough investigation of the matter upon the members of the Club.

Mr. Blyth observed, that the extract of Cotyledon Umbilicus had been largely tried at St. Mary's Hospital, more especially by Dr. Sieveking, and the effects had been so satisfactory, in some cases of

epilepsy, in causing a remission of the attack, as to justify its further use. He did not know from what part of the country the plant was obtained from which the extract supplied to the Hospital was made—but the extract itself was unexceptionable. It was the province of the pharmaceutist to prepare a good extract—it was the province of the physician to judge of its effects.

There will be no meeting of the Phytological Club in the month of April. The next meeting will take place, therefore, on Wednesday, May 10, at 9 p.m.

Friday, March 17, 1854.—Edwin Lees, Esq., F.L.S., delivered a highly interesting and instructive lecture "On the Geography of Plants," to the members of the Worcester Branch of the Phytological Club, and their friends, in All Saints' School-room, Worcester.

Mr. Lees, having been introduced by Mr. J. S. Walker (President of the Worcester Branch of the Phytological Club), commenced his address by briefly touching upon the various motives that led to the love and study of Botany, and vindicated the science from the charge of "dryness." Mr. Lees then proceeded to mention the different ways in which plants had been regarded at different times. Originally they were only valued as furnishing food; and acorns, chestnuts, and beech-mast, had been the first aliment of mankind before the cultivation of corn. After that golden age, magical and superstitious qualities were ascribed to plants, especially if gathered at particular times. The Greeks and Romans considered Pontus, in Asia Minor, as a famous place for dire venomous plants, that would change the very nature of man; and the "sacred bean," the fruit of the Nelumbium speciosum, was supposed by the greatest philosophers to possess a mysterious influence. In our own country the mountain ash and service-tree were considered antidotes to witchcraft; and this was the reason the elder-tree was seen at every cottage-door, because it had been considered to keep out all unnatural intruders. Agrimony and mugwort, as well as many others, were considered "plants of power;" the former, placed under a man's head, threw him into a state of torpor, while the latter gave him pedestrian powers almost equal to the giant's seven-leagued boots! After the invention of printing, and the consequent general spread of knowledge, magical herbs began to be regarded with incredulity. But now another phase in the history of plants occurred. They became "speed-wells,"

"wound-worts," and "all-heals;" they were expected to cure every disorder in the catalogue of human ills, and every garden became a little Apothecaries' Hall. This was the *belle dame* age of medicine, when the old woman doctress had much more to do than the apothecary, and worked her pestle and mortar to good purpose. About a quarter of a century ago, one Mrs. Welton was well known at St. John's, near this city, as a doctress, and a "grand compounder" of balsams, salves, syrups, &c., and did a wonderful business in the "yarb" way.

"'Midst leaves and flowers
She dwelt, and knew all secrets of their powers."

He now came to geographical Botany, for it was to be observed, that plants, being influenced in their development by soil, by latitude, temperature, moisture, and elevation, the Flora of one country was essentially different from that of another, each region of the land and water being occupied by distinct groups. As striking instances of diversity in vegetation, no rose had ever been found in the southern hemisphere; equinoctial Africa had no Lauriniæ, and while more than 300 species of Erica, or heath, were congregated in the territory of the Cape of Good Hope, none belonged to America, except it was the common ling in the far North. The pines and firs, so abundant in the northern hemisphere, were replaced in the south by Araucarias and Cycadeæ. Islands in the wide ocean had generally a peculiar vegetation, the Canaries had 510 species, and St. Helena nearly 60, that had never been seen elsewhere. So the plants of South America were restricted to that continent, and out of 4,100 indigenous to Australia, only 166 belonged to Europe, many of these, too, accidentally introduced by settlers. Even marine vegetation was distinct in its character, that of the Mediterranean and Red Sea being entirely different. Reference was then made to many local British plants only found in particular spots, as the Helianthemum Breweri, on the rocks at Holyhead; the white rock cinquefoil (*Potentilla rupestris*), on Craig Breiddin, in Wales, &c.; and thus a zest was given to the zeal of the exploring botanist in searching out the rare plants thus circumstanced. Heat and moisture were the great instigators of plantal vitality, and where these preponderated, as in equatorial regions, the largest flowers appeared, as the Victoria lily and the monstrous Rafflesia, whose corolla was a yard across. Here, too, palms and bananas abounded, as also in the tropical zone, distinguished by its cocoa-nuts and tree-ferns. The earth might, then, be divided into

zones of vegetation, in parallelism with zones of temperature, till, progressing towards the pole, trees became utterly stunted, every trace of verdure disappeared, and a few solitary lichens, amongst pyramids of ice, or a stain of crimson amidst wastes of snow, alone testified to the all but extinguished spark of phytological existence. These zones of vegetation were repeated upon the mountains, with their increasing height, in exact correspondence between the decrement of heat from the equator to the poles. On the Alps and Pyrenees, at the elevation of 8,780 feet, it was as cold as the region of the poles at the level of the sea, and though the snow-line was higher at the equator, even there all vegetation ceased at an elevation of 15,200 feet. The size of plants was much diminished on the sides of mountains; but the beauty of natural Alpine gardens, among black ravines and broken crags, was so exciting, that any one who once trod upon such an oasis of beauty long remembered it amid the dusty scenes of every-day life. Though the distribution of plants on the earth was clearly governed by temperature, the "isothermal lines" of mean annual heat did not progress uniformly, and thus the eastern countries of Europe, Asia, and America had a much lower temperature than the western, and plants were affected accordingly. In Norway, the silver fir, black alder, and others, grew under the polar circle, while eastern Siberia and the vast extent of Labrador, north of 60 deg., was quite treeless. The limitation of the cultivated plants was next noticed:—nutmegs, coffee, cocoa, and the finest spices, were limited to inter-tropical regions; cotton, rice, and olives grew in lat. 45 deg.; the vine, to 50 deg.; while in the West of Europe, the cultivation of wheat, flax, and tobacco, ceased at 60 deg.; but hemp, oats, barley, rye, and potatoes, progressed into the polar circle. The southern hemisphere, from the greater accumulation of ice at the poles, was colder than the northern. This was well shown by a comparison of the indigenous flowering plants of our little Channel Islands, Guernsey, Jersey, &c., with the larger Kerguelen's group, in the same parallel of latitude South. The former isles possessed 840 species, but Kerguelen's only 32. The physiognomy of vegetation was next adverted to, those peculiar features of associated plants that the eye at once seized upon, in any country, and connected with early recollection, as "the vegetable forms of our father-land." Seas, mountain-chains by their intervention, formed provinces of plants, and thus the greatest diversity prevailed in the clothing of the earth's surface. As striking examples, the forests of Australia and Van Diemen's Land were composed of evergreen Eucalypti; tree-ferns abounded in New Zealand; the singular

tribe of Cacti in Mexico; Acacias and aloes in Southern Africa; and the Himalayan Mountains were the grand capital of the Rhododendrons. Fir-forests extended in Norway and Russia for hundreds of miles; while in North America cypresses formed enormous woods and vast dismal swamps. These assemblages of plants fixed the natural physiognomy of countries by their beauty, singularity, or imposing size. The greatest natural families of plants were next detailed in order, but an instance or two of these must suffice. The grasses, of which there were 4,000 species, was a most remarkable group. These, forming vast natural meadows extending for 60,000 square leagues in South America, rose in magnitude according to climate; in Brazil, the grasses were 12 feet high, and a reed was mentioned by Schomburg that was 40 feet; while, in India, the bamboos were arboreal, and rose to 100 feet. The palms, the nobles of the vegetable kingdom, were confined to the vicinity of the Tropics, but were numerous there, as 120 species grew in South America. The talipot palm of Ceylon towered to 200 feet in the air, while the little Chamærops, just venturing as far North as the Rock of Gibraltar, was in that position as unaspiring as our common male fern under a hedge. The *lianes*, or cordage plants of warm countries, often entangle the tropical forest in an inextricable maze—they rose to the tops of the highest trees and again descended, formed bridges over rivers, and extended for miles from their original source. The fern tribe was singularly affected by moisture, for while 1,200 species grew in the damp forests of the Equator, only 144 existed in the temperate zone, and in Egypt, where rain seldom if ever fell, only one species was known. Nations and countries had peculiar features impressed upon them by their plants, and romance and poetry were ready to take advantage of the bright imagery of Nature, which thus supplied pictures of a brighter or darker hue, according as sunny or snowy climes, flowery or arid regions, presented their lights or shadows to the brooding mind. But plants were in many instances so limited by geographical considerations, that their localities were placed within the narrowest compass. The Arabs were accustomed to mark their course across the Syrian Desert, by the peculiar plants that presented themselves at certain intervals; and in America the compass-flower of the prairies, whose leaves pointed to the North, had been celebrated for the aid it afforded the traveller in those boundless wastes. The tea-plant, it was well known, was confined to the hilly districts of China and Japan; but in South America a species of holly furnished another kind of tea peculiar to that continent, and equally

prized by the natives. The Quinquina, or Peruvian bark, was confined to a small district of the Colombian Andes; and cocoa and chocolate were the produce of a plant limited to the warmer regions of South America. Numerous other instances of plantal limitation might be given, as the cow-tree of Venezuela, the tussock-grass (*Dactylis cæspitosa*) of the Falkland Isles, the hand-tree of Mexico, whose gory flowers were regarded with awe, and of which only two living specimens were known; and the double cocoa-nut (*Ladoicea Sechellarum*) of the Seychelle Islands, in the Indian Ocean, which, till those islands were discovered, in 1789, had been believed to be produced by the sea, and valued as a talisman at a very high price. One more curious plant might be mentioned—the Maltese champignon (*Cynomorium coccineum*), which only grew on the little rock of Gozo, near Malta. The knights of Malta had a superstitious veneration for it, and appointed a *custode* to guard the spot, and since Malta had been appended to England, the salary of this *custode* had been paid by the British Government, and might be an appropriate appointment for a botanist. The lecturer observed that the manners and habits of different peoples were much influenced by vegetable products, and the temperature that limited the growth of grain also stopped the progress of the human race; where sustenance was easily procured by fruits and rice, as in tropical regions, the inhabitants were indolent and apathetic, and really only exhibited the highest amount of intellect where Rubi and bitter wild berries offered little temptation to a lazy dweller in the woods. Plants, however, were the children of the sun, and luxuriated most in heat and brightness, so that when they were transplanted into colder regions they must have additional care and attention, because other conditions arose than those Nature had originally provided. Mr. Lees concluded with eloquent observations on the moral bearings of the subject, resulting from an investigation of the works of Nature, and the elevation of thought they inspired.

The lecture was profusely illustrated with most excellent diagrams of geological formations, tree-ferns, palms, Cacti, and plants of various kinds. A beautiful collection of dried plants was placed for the inspection of the company, and many were handed about during the lecture, amongst which was a dried specimen of the smallest palm, brought from Gibraltar. At the conclusion of Mr. Lees's address Mr. Gissing, the Secretary, on the part of the Phytological Club, returned thanks to Mr. Lees for his very instructive and entertaining lecture. Mr. Baxter returned thanks to the Rev. W. A. Hill for the use of the

room; and that gentleman, in acknowledging the vote of thanks, spoke in very high terms of the lecture and lecturer.—Mr. Lees having briefly replied to the vote of thanks the company separated.

Greenwich Natural-History Club.

Saturday, February 25, 1854.—George Busk, Esq., F.R.S., President, in the chair.

Fungi of the Neighbourhood of Greenwich.

Mr. Currey made some observations on three new Fungi which he had found in the neighbourhood.

"Since our last meeting, I have met with three Fungi which I had not previously found in this neighbourhood, and which are of an interesting nature. Two belong to the genus Sphæria, and the third is, I believe, a Coryneum. The first of the Sphæriæ to which I wish to call attention is a beautiful plant, the species of which is somewhat doubtful. It appeared to me to be the Sphæria ochracea of Greville, which is one of the rarest of our English Fungi; but a friend, whose experience in these matters is much greater than my own, tells me that it is not the true Sphæria ochracea, but comes nearer to S. aquifolia or S. Sinopica. I have not been able to refer to any description of S. Sinopica; but, with regard to S. aquifolia, my plant differs in having the perithecia covered with bright yellow scales, and, moreover, the depression of the apex of the perithecium, which in S. aquifolia is to be found only in old plants, exist, in my species, indifferently in both young and old. I hope this Sphæria may prove a new species: at present it is doubtful. With respect to the description, I would add that that the fungus is very minute. A yellow spot, about the size of a large pin's head, contains an aggregation of several plants; so that it requires the aid of the microscope to distinguish even the external characteristics. If you imagine a flattened Seville orange, with a crater-shaped depression at the top, and well powdered with sulphur (or rather with some powder of a brighter yellow than sulphur), it will give a correct idea of an individual of the group. The other Sphæria is S. inquinans. In this fungus the perithecia lie concealed beneath the bark of trees. The spores are discharged through an orifice at the apex of the perithecium, and are spread over the external surface of the bark, being enveloped in a sort of gelatinous

matter. When I first examined this fungus, and before finding the perithecia, it appeared to agree almost precisely with Corda's description of a plant called by him Apotemnoum maculans. His description is 'Sporæ septato-articulatæ gelatinâ immersæ.' It has been suggested to me that very possibly Corda's Apotemnoum may be nothing more than the present Sphæria. If so, he must have taken the gelatinous mass with the imbedded spores to be an independent fungus, overlooking the buried perithecium. This Sphæria inquinans is a highly interesting fungus, from certain peculiarities connected with its fructification. The spores are furnished with a long cirrhiform appendage at either end, which is frequently, if not generally, detached before the spores are discharged from the perithecium. But a more remarkable circumstance is, that the same perithecium has been found to produce asci internally, and naked stalked spores externally. These naked stalked spores have been supposed to be a distinct fungus, to which the name of Stilbospora macrosperma has been applied; but the opinion seems to be gaining ground, that they are, in fact, transformations of the asci themselves. I would add, that in one of the specimens which I examined I found naked spores in the *interior* of the apothecium, mostly intermixed with gelatinous filaments, and not attached to long stalks. The third fungus mentioned above was a Coryneum, too old for the species to be satisfatorily determined; and I only refer to it to mention, that in connexion with one specimen I observed in the field of the microscope, a loose cellular hood, or envelope, having just the appearance which a cellular covering, carried upwards by the growth of the spores, might be supposed to have. The spores in Coryneum *grow* in such a manner as to render this possible; but I am not aware that any such circumstance has been noticed, and the body in question may have had no connexion with the Coryneum. I thought it, however, worth mentioning, as other observers may perhaps be inclined to turn their attention to it."

Elaters of a Trichia.

Mr. Currey also called the attention of the Club to a preparation of the elaters of a Trichia, mounted for the microscope. It was in these elaters that Mr. Henfrey had lately announced the existence of spiral fibres, analogous to those in the elaters of Marchantia polymorpha; thus contradicting the published observations of Schleiden and Schlacht, who declare that the appearance of a spiral fibre is due to a

twisting of the tube. From a subsequent examination of the specimen by the President, he was convinced that Schlacht's opinion was correct; and that the figure he has given of the appearance is accurately and faithfully rendered.

Thursday, April 13, 1854.—George Busk, Esq., President, in the chair.

This was the Second Anniversary of the Club, convened for the purpose of electing officers.

Election of Officers.

The Treasurer's accounts having been audited, the following gentlemen were elected as office-bearers for the ensuing year:—President: George Busk, Esq., F.R.S. Vice-President: J. B. Spencer, Esq. Treasurer and Hon. Sec.: Cuthbert Collingwood, Esq., M.A., F.L.S. Committee: F. Currey, Esq., M.A.; J. W. Douglas, Esq., Sec. E.S.; James Glaisher, Esq., F.R.S.; P. Purvis, Esq., M.D.; Flaxman Spurrell, Esq.

The President then delivered an address, commencing by a statement of the number of members, which has more than doubled since the last Anniversary, and now amounts to forty-seven. He then briefly reviewed the proceedings of the Club during the past year, giving an epitome of all the meetings, both in the field and in the meeting-room; and congratulating the Club on the promising aspect it had assumed.

This terminated the in-door proceedings for the winter; and it was announced that the first field-meeting would be held on Thursday, April 27.—*C. C.*

The Phytologist Club.

One Hundred and Fifty-Sixth Sitting.— Saturday, April 22, 1854.—Mr. Newman, President, in the chair.

The President read the following communications :—

Statice Dodartii a Native of Ireland.

"In the 'Phytologist' (v. 77) my friend Mr. Carrol, of Cork, mentions that S. binervosa has been found at Tramore, near Waterford. As that announcement leaves it doubtful which of two (as I believe) perfectly distinct species ought to be added to the Flora of Ireland, I applied to him for a specimen. On his kindly sending one, I learn that it is the S. Dodartii, *Gir.*, that grows at Tramore. I think it right that this should be made known through the 'Phytologist.' The S. binervosa, *G. E. Smith*, includes this and S. occidentalis, but the latter is the more typical of his species. S. spathulata of Hooker also includes the same two, but apparently he had S. Dodartii in view rather than its ally."—*Charles C. Babington.*

Note respecting Carex Mœnchiana as a British Plant.

"This species, I believe, has never been mentioned in print as an inhabitant of Britain; so that the following extract from a letter dated 'Mytholmroyd, April 23rd, 1847,' written by the late S. Gibson, formerly of Hebden Bridge, just before his decease, is worthy of attention :—

"'In 1843 I found Carex Mœnchiana in abundance near Hebden Bridge. The plant I sent to Dr. Boott, and have his authority for the correctness of the name.'

"Not having seen any specimens, I am not practically acquainted with C. Mœnchiana; nor have I access at present to Reichenbach's original description; and therefore transcribe the diagnostic characters from Woods' 'Tourist's Flora :'—

"'Section F. Spikes separate: upper barren: stigmas two.

ii. Beak round, short, and smooth: or wanting. Fruit hairless. Bracts not sheathing.

b. Barren spikes two or more.

* * Barren spikes with fertile flowers at the base.

73. *C. Mœnchiana.* Fertile spikes erect, acute, on short stalks. Fruit smooth, ovate, obtuse, shorter than the lanceolate acute

glume. Root creeping. Lower bracts long, p. 5. Devil's ditches at Marburg in Hesse; Reichenbach.'
—*Woods' Tourist's Flora*, p. 389.

"Its most intimate allies amongst British species appear to be C. aquatilis, C. stricta, and C. acuta. If no other botanist can furnish more complete and definite information respecting its occurrence, perhaps it will be safest, under the circumstances of the case, to place it for the present in the doubtful category, side by side with C. brizoides, till its rediscovery enables us to receive it with complete confidence; but it is not unlikely that if sought for specially it may be found to inhabit other localities."—*John G. Baker; Thirsk, April* 17, 1854.

Another Locality for Salix acutifolia.

Mr. Baker also forwarded the following, extracted, by permission, from a letter sent to him by Mr. James Ward, of Richmond, Yorkshire, dated April 7, 1854:—

"I am exceedingly obliged by your kindness in sending me specimens of Salix acutifolia, *Willd.*; and beg to inform you that I discovered the same species in May, 1831, on the banks of the river Ure, near Wensley, in Wensley Dale, Yorkshire. I only preserved a single specimen, which I now have in my herbarium; being told it was not a British species: at the same time, I thought it must be so, as it appeared as perfectly wild as any of the others amongst which it was growing. I have no doubt it is still in the same place, but have not been there for some time. When I found it, I was not so well acquainted with willows, and therefore thought no more about it."

Chrysosplenium alternifolium, &c., near Cheltenham.

"Crossing the Cotswold Hills the other day, from Cheltenham to Stow-on-the-Wold, I gathered on the border of Dowdeswell Wood, near Cheltenham, Chrysosplenium alternifolium. It was growing in great abundance. Further on, about two or three miles, by the roadside, and nearly opposite Sandywell Park, far from any house, I saw Helleborus viridis growing most luxuriantly, although only a few plants. On one of the highest hills on my road, I found Cerastium arvense sparingly; and at Naunton, on the border of a field adjoining Harford Bridge, that spans the Windrush, Veronica Buxbaumii was growing in such profusion as to make the ground quite blue for yards."—*T. W. Gissing; 44, High Street, Worcester, April* 21, 1854.

Supposed new Fern.

"I am happy to forward you a few fronds of a new fern I have discovered here, hoping you may be able to make it out; but it is not in fructification: yet I am in doubt that when you receive it the fronds may have dried too much, and of course be useless, as the plant is very tender; but, if such be the case, I could send you more when the plants are more advanced. I discovered it about six weeks ago. I had been gathering some Gymnogramma; and so early in the season there is nothing but the radical leaves to be found. I happened to be in a very wet lane, in which there were several trees, when I saw, under the overhanging part of an old hedge, a quantity of leaves, resembling a little those of Gymnogramma leptophylla, except that they were of a darker green, and rather more cut; and on comparing them with the Gymnogramma I concluded they must belong to another species of the same genus. I therefore took a piece of mould, with some of the seedlings upon it, and planted it under a bell glass, alongside seedlings of G. leptophylla. After a month's time, I found that the new one was different from anything I knew; and I thought it had the habit of an Asplenium. I went to the spot again, and gathered more; but the specimens were very small, scarcely a quarter the size of those under a bell glass. I now send you one from the plant I gathered first. This is a water-loving fern, and grows in totally different places from G. leptophylla. A friend of mine is going up to London in about a month, and I shall send you a nice growing specimen by him. I have no doubt of the Gymnogramma being indigenous here." — *John Piquet;* 14, *York Street, Jersey, March* 14, 1854.

The President observed, that the fronds which Mr. Piquet had so obligingly transmitted with the foregoing note did not exceed an inch in length; the stipes and rachis were extremely fragile and delicate; the fronds respectively consisted of four, five, and six, flabelliform, sessile pinnæ, indented along their outer margin; there was no trace of fructification; and he failed to discover the difference which Mr. Piquet believed to exist between these fronds and those of G. leptophylla.

Notices of New Books.

'*A Plain and Easy Account of the British Ferns; wherein each Species is particularly described under its respective Genus, and the characteristics of those Genera given in words in common use: with a Glossary of Technical Terms, serving as a Key to larger Treatises.* London: Robert Hardwicke, 38, Carey Street. 1854.'

"Of what vast consequence am I!
Not of the importance you suppose,
Replies a flea upon his nose."

Gay's Fables.

Here is a book that must subtract very materially from any inflated idea that Mr. Newman may have formed of his own importance as an historian of British ferns. He is not criticized; he is not in any way spoken slightingly of; but there is the most clear and unmistakable evidence that he is utterly unknown. Francis is regarded as the great pteridologist of Britain: Thomas Moore's 'Handbook' is too "complicated in its plan of arrangement;" and the same author's 'Popular History' "has the same complicate classification." We may, perhaps, venture to correct the author on the latter point, by just mentioning that the "complicate classification" complained of is not intended as a classification at all: it is an alphabetical arrangement. "In the following pages," says our author, "the subject has been more simplified." In order to acquire a knowledge of the British ferns without troubling himself with the recondite labours of Francis and Moore, the reader is informed, in the opening paragraph, that—

"As every formal fern comes under one or other of the Heads [what Heads?], it is only necessary in any case to look at its fructification, and then, by casting the eye down the following list, the genus to which it belongs will be seen at once." The characters of the genera on which the reader is requested to cast his eye are recorded thus:—

"'Sori in entire cups, springing from the branch."

"Sori oval, on the inner surface of the Indusium."

It strikes us as possible that not only beginners, but also experts, might be found who would stumble even at these curt and simple definitions; but then the remedy is at hand: the glossary's the thing

wherein the author fully explains all the terms which he employs, and extends it so that it shall serve also for the "larger treatises" of the scientific Francis and the recondite Moore: the veriest tyro cannot complain of being left in the dark, however he might have been lost for a moment in the technical obscurity of the foregoing quotations. Here are extracts.

"Anther, the vessel containing the fertilising farina affixed to the top of the stamen or barren filament of a flower or blossom.
"Athyrium, a separate class assigned by some writers to the Asplen: Filix Fœmina.
"Blechnum spicant, name used by some writers for the boreale.
"Pistil, the fertile filament or little column in the interior of a flower or blossom.
"Pollen, the fecundating farina of a plant.
"Pubescent clothed with soft wood.
"Silicious, composed of hair-like substance.
"Stamen, the barren filament or thread-like column in the interior of a flower or blossom.
"Stigma, the point of the pistil or fertile filament in the interior of a flower or blossom receiving the farina."

Many of our readers will perhaps be led to infer from some of these definitions, that the author intends the "glossary" as a general, not as a pteridological one: this we assure them is not the case. We will not enquire whence our author derives his profound erudition, but we are certain that he believes it explanatory of that restricted branch of Botany, of which his work professes to treat: such words for instance, as "corolla," "calyx," "sepal," "petal," &c., do not occur in the glossary.

Amongst other peculiarities, we are informed that Asplenium palmatum, or the mule fern, by some called Scolopendrium Hemionitis, grows wild in Essex; Woodsia Ilvensis is "of no particular beauty or interest intrinsically;" W. hyperborea is "of a little more interest." The genus Trichomanes is like the genus Hymenophyllum, "only the leaves not prickly, wider, and more rounded." Of Botrychium we have these particulars in the "plain and easy account," which we compare with those in the "complicate" 'Handbook:'—

In the 'Plain and Easy Account,' p. 29.	*In the "complicate classification" of Mr. Moore,* p. 217.
"Difficult of cultivation.	"Difficult plant to get established under cultivation.
Prefers to be kept moderately dry, cool at root,* and with fresh air and rich vegetable soil.	It rather prefers to be kept moderately dry, cool at the root, and where there is a circulation of pure air. It prefers rich vegetable soil.
The root to be transplanted in spring, while yet dormant."	The roots should be transplanted in the spring, when dormant."

The similarity of these passages is of high interest, and, of course, is purely accidental, for no allusion whatever is made by the "plain and easy" author to his having borrowed this information from another. Those who chance to read the third edition of Newman's Ferns, will find it stated that Botrychium is the easiest of all ferns to cultivate; that it must be kept entirely without rich vegetable "soil;" and that it must be taken up when the frond has attained its full expansion at Midsummer: the "plain and easy" author, as well as the "complicate" one, have totally forgotten the incontestible fact, that they could not find the plant "while yet dormant."

We are glad to announce that 'A Fasciculus of Dried Specimens of the Hieracia of North Yorkshire and Teesdale,' by our correspondent, Mr. J. G. Baker, will shortly be issued. The following is a list of species: — H. Pilosella, *L.*, aurantiacum, *L.*, iricum, *Fries*, pallidum, *Biv.*, murorum, *L.*, cæsium, *Fries*, and var. nemorum, *Fries*, H. vulgatum, *Fries*, and vars. maculatum, *Sm.*, medium, *Fries*, maculatum-sylvaticum, *Sm.*, sylvaticum, *Sm.*, H. gothicum, *Fries*, tridentatum, *Fries*, and var. nemorosum, H. umbellatum, *L.*, crocatum, *Fries*, and var. angustatum, *Fries*, H. boreale, *Fries*, and var. nemorosum.

* Probably because "this plant is hot and drie in the third degree."—*Ed. Phytol.*

A brief Notice of some Plants observed growing in the Neighbourhood of Streatley, Berks, and of Goring, Oxon, in April, 1854; *with Additions of such Plants as have been gathered there during several visits in former years, viz., between* 1833 *and the present* 1854. By William Pamplin, Esq., A.L.S.

It would be difficult to find two villages of more rural character, or, in every respect, more pleasantly situated, than Streatley on the Berkshire, and Goring on the Oxfordshire, side of the Thames. If you take a circuit of country, including the adjoining parishes of Moulsford, Aldworth, Bassildon, Pangbourn (Berks), and Whitchurch, Mapledurham, Woodcot, and South Stoke, Oxon, you have altogether the greatest variety of beautiful scenery. The silvery, winding Thames, with its rich meadows and ozier holts, a gradual, in some places a very abrupt rise thence on each side of the river up to the high chalk downs, extensive sheep-walk, and fine hanging woods of beech and fir, with here and there distant views over a fine open corn country, interspersed with villages and farms, afford a most delightful variety of scenery which cannot easily be surpassed. The view from the upper part of Streatley Downs, or from the brow of the hill, as you approach the village by the Aldworth road down a deep-worn hollow lane, is exceedingly pleasing; you have the two parish churches, well sheltered with tall trees and orchards, and the adjoining country studded with picturesque cottages and old buildings, with the fertile valley of the Thames, all lying spread before you.

Now for the plants: before giving a regular list of them, it may not be amiss just to offer some general remarks upon the character of the Botany of the district.

This is the head quarters for Anemone pulsatilla, now (April 21st) in full flower, Cineraria campestris, also in flower (April 27th), Orchis ustulata, O. militaris, and O. tephrosanthos, Iberis amara, Linaria repens, and in the corn and turnip-fields the beautiful large-flowered Veronica Buxbaumii is very abundant and ornamental. The Pyrola media also grows in largish isolated patches as you go from Goring towards Henley, but I have not noticed it on the Berkshire side yet. The chalk hills are studded with juniper and yew. Speaking of the yew, reminds me that in Aldworth churchyard there is a most remarkable and venerable tree; this yew-tree (noted by topographers) appears to be of extraordinary age, and is of

enormous size: Loudon, in his 'Arboretum,' gives us some particulars about it. It is rather early to say much about the two Orchides, O. militaris and O. tephrosanthos, but I am sorry to observe that, from some cause or other, the number of plants seems to diminish annually; the chief cause of this I was once an eye-witness to, for a fine sloping bank (so steep that you would think the farmer could derive no great benefit from disturbing it) was actually being stubbed up and burnt for manure; the man and the monkey Orchises being both literally roasted and burnt alive; and upon this very bank I had, in former years, through the kind direction of my esteemed friend, Mr. Baxter, of Oxford, noticed them growing in plenty. Merrett,* in his time, and How,† tell us that not only these Orchises, but several of the Ophrydes grew abundantly upon the "chalky hills overlooking the Thames, both on the Barkshire and the Oxfordshire sides of the river, between Cawsham [Caversham] and Wallingford;" and, as regards the Ophrydes, the very spot where I had formerly seen abundance of the bee, &c., has been ploughed up and turned into corn-land. There is one tribe of plants in which this neighbourhood is quite deficient, viz., ferns; there are scarcely any here, so far as observation goes: I find my list contains but four.

Clematis Vitalba
Anemone Pulsatilla
nemorosa
Adonis autumnalis
Ranunculus auricomus
Caltha palustris
Aquilegia vulgaris
Chelidonium majus
Fumaria officinalis
Capsella Bursa-pastoris
Iberis amara
Lepidium campestre
Armoracia rusticana
Draba verna
Cardamine pratensis
impatiens
Arabis thaliana
Barbarea vulgaris
Nasturtium officinale
terrestre
Sisymbrium officinale
Erysimum Alliaria
Reseda lutea
Helianthemum vulgare
Viola odorata
b. alba
hirta
canina
a. sylvatica
tricolor, b. arvensis
c. Curtisii
Polygala vulgaris
Saponaria officinalis
Silene inflata
Lychnis Flos-cuculi
Sagina procumbens

* Merrett's 'Pinax,' p. 85, (1666). † How's 'Phytologia Britannica,' (1650).

Sagina apetala
Spergula arvensis
Arenaria serpyllifolia
Stellaria holostea
Cerastium arvense
Linum catharticum
Malva moschata
sylvestris
Hypericum perforatum
hirsutum
montanum
Erodium cicutarium
Geranium pratense
pusillum
molle
dissectum
Robertianum
Oxalis Acetosella
Euonymus europæus
Rhamnus catharticus
Frangula
Spartium scoparium
Ulex europæus
Ononis arvensis
Anthyllis Vulneraria
Medicago lupulina
Trifolium repens
subterraneum
fragiferum
Lotus corniculatus
Ornithopus perpusillus
Hippocrepis comosa
Onobrychis sativa
Vicia Cracca
sativa
sepium
hirsuta
tetrasperma
Lathyrus pratensis
Orobus tuberosus
Prunus spinosa
Prunus avium
Spiræa Filipendula
Geum urbanum
Agrimonia Eupatoria
Potentilla anserina
Tormentilla
Fragaria vesca
Rubus fruticosus
Idæus
Rosa rubiginosa
Sanguisorba officinalis
Alchemilla arvensis
Cratægus Oxyacantha
Pyrus Aria
Epilobium montanum
Circæa lutetiana
Lythrum Salicaria
Bryonia dioica
Scleranthus annuus
Sedum acre
reflexum
Forsterianum
Saxifraga granulata
tridactylites
Adoxa moschatellina
Hedera Helix
Cornus sanguinea
Sanicula europæa
Petroselinum sativum
Bunium flexuosum
Pimpinella Saxifraga
Bupleurum rotundifolium
Angelica sylvestris
Pastinaca sativa
Heracleum Sphondylium
Daucus Carota
Scandix Pecten
Viburnum Opulus
Lantana
Lonicera Periclymenum
Sherardia arvensis

Asperula odorata
cynanchica
Fedia olitoria
Scabiosa succisa
Knautia arvensis
Lactuca muralis
Taraxacum officinale
Lapsana communis
Cichorium Intybus
Arctium Lappa
Carduus nutans
acanthoides
tenuiflorus
eriophorus
acaulis
Carlina vulgaris
Centaurea nigra
Scabiosa
Tanacetum vulgare
Artemisia Absinthium
vulgaris
Gnaphalium sylvaticum
Petasites vulgaris
Tussilago Farfara
Solidago Virgaurea
Cineraria campestris
Inula Conyza
Bellis perennis
Chrysanthemum segetum
Leucanthemum
Pyrethrum Parthenium
Matricaria Chamomilla
Campanula rotundifolia
glomerata
Specularia hybrida
Pyrola media
Monotropa Hypopitys
Ilex Aquifolium
Ligustrum vulgare
Gentiana Amarella
Erythræa Centaurium
Chlora perfoliata
Convolvulus arvensis
sepium
Solanum nigrum
Dulcamara
Atropa Belladonna
Verbascum Thapsus
nigrum
Veronica arvensis
serpyllifolia
officinalis
montana
Chamædrys
hederifolia
agrestis
Buxbaumii
Euphrasia officinalis
Digitalis purpurea
Antirrhinum majus
Linaria Cymbalaria
spuria
Elatine
repens
vulgaris
Verbena officinalis
Lycopus europæus
Thymus Serpyllum
Origanum vulgare
Calamintha Acinos
Clinopodium
Ajuga reptans
Ballota nigra
Lamium Galeobdolon
album
amplexicaule
purpureum
b. incisum
Galeopsis Ladanum
Tetrahit
Stachys Betonica
palustris

Stachys arvensis
Glechoma hederacea
Nepeta Cataria
Marrubium vulgare
Prunella vulgaris
Myosotis palustris
sylvatica
arvensis
Lithospermum officinale
arvense
Symphytum officinale
Echium vulgare
Primula vulgaris
veris
Lysimachia Nummularia
nemorum
Anagallis arvensis
Plantago major
media
lanceolata
Chenopodium Bonus-Henricus
Rumex Hydrolapathum
crispus
pulcher
Daphne Laureola
Thesium Linophyllum
Euphorbia amygdaloides
Merculiaris perennis
Parietaria officinalis
Humulus Lupulus
Fagus sylvatica
Corylus Avellana
Alnus glutinosa
Juniperus communis
Taxus baccata
Spiranthes autumnalis
Neottia Nidus-avis
Listera ovata
Epipactis latifolia
grandiflora
ensifolia ?
Orchis mascula
ustulata
militaris
c. tephrosanthos
pyramidalis
maculata
Gymnadenia Conopsea
Habenaria bifolia
Aceras anthropophora
Ophrys apifera
Iris fœtidissima
Pseudacorus
Narcissus Pseudo-narcissus
Hyacinthus nonscriptus
Ruscus aculeatus
Tamus communis
Alisma Plantago
Arum maculatum
Brachypodium sylvaticum
Polypodium vulgare
Lastrea Filix-mas
Asplenium Ruta-muraria
Pteris aquilina

William Pamplin.

45, Frith Street, Soho,
April, 1854.

Notices of New Books.

'*The History of British Ferns.*' By Edward Newman, Memb. Imp. L. C. Acad., F.L.S., Z.S., B.S., Pres. Ent. Soc., &c., &c., &c. Third Edition. London: Van Voorst. 1854. 360 pp.; 136 illustrations on wood. Price 18*s.*, Demy 8vo.; 36*s.* Royal.

The long-made promise is at length fulfilled: after delays and procrastinations extending through a period of five years, the third edition of the 'History of British Ferns' is fairly on the bookseller's counter, arresting the attention of the book-buyer by the magnificent covering of green and gold with which Messrs. Cash and Astle have been pleased to invest it; and offering an irresistible bait to those who

"Value books, as women men, by dress."

But it is not by the dress that the editor of the 'Phytologist' must estimate a work on science; neither does he wish the outside to influence a single purchaser: he merely mentions the binding, that he may have the pleasure of thus publicly thanking the gentlemen who have performed their part in the resuscitation of the long-lost 'British Ferns' with such admirable taste and skill: for be it known unto all men, that the editor of the 'Phytologist' and the author of the 'British Ferns' are one and the same.

How then can the reader expect a good review? Exactly on the principle that every man can best explain, if he so please, his own doings and his own views; and if he venture beyond explanation, if he be once detected patting himself on the back, and saying "well done," why the reader will instantly draw the pen of his mind through the passage, and set down the writer as a mere simpleton: the knowledge that this must inevitably be the case, will protect the editor from so egregious a blunder. On the other hand, the reader is guaranteed against captious criticism; an author is sure not to vilify his own production. He can do nothing but explain and quote, and from his explanations and quotations, without a word of praise or blame, the reader will draw his own conclusions, much in the same way as from the book itself.

The volume contains 360 pages of letter-press and 136 illustrations engraved on wood; many of the figures are new, but of these, the following only require to be noticed: — two forms of Capillus Veneris; a copious and elaborate illustration of Gymnogramma leptophylla, exhibiting a variety of forms; the vernation of Eupteris, contrasting it with Pteris; Gymnocarpium Robertianum; Cystopteris Dickieana; Pseudathyrium alpestre; Pseudathyrium flexile; Asplenium acutum; Phyllitis Scolopendrium, showing the cordate bases of the fronds, not visible in the former illustration; Botrychium rutaceum; and Ophioglossum lusitanicum: with the exception of Scolopendrium, which is reduced, all these are exactly of the natural size.

The following portions of the second edition are omitted from the third:—The genera Equisetum, Lycopodium, Isoëtes, and Pilularia; also a great number of the habitats of the *commoner* species, and a large portion of the critical remarks on the bibliography of the species.

The following additions are made:—A short diagnostic character of every genus and species; a synonymic reference to all British and the more important continental describers; and careful directions for the cultivation of every species.

The following alterations have been made: — The history of each species is divided into heads, which are thus intituled:—Characters; Synonymes, Figures, &c.; Geographical Range; Description; Varieties (if any); Culture; Economical uses: the details of the habitats of the *rarer* species are more minutely given than in the second edition, and those which are unsatisfactory, from any cause whatever, are inclosed in parentheses.

The arrangement remains unaltered, but the author's views of classification are thus explained at length:—

"It is impossible for the candid mind to dwell for a moment on the fact that Britain produces only about one-fortieth part of the ferns already known as inhabiting the globe, without perceiving the impracticability of arranging that fractional part in anything like a connected series. Select one British species, Capillus-Veneris, for instance, and we shall find that there are at least a hundred exotic species which approach it more closely than any that occur in Britain: therefore, assuming that two thousand ascertained ferns constitute a connected chain, it follows that in Britain a hundred links are wanting at that part of the chain where Capillus-Veneris is situate. There is still another mode of accounting for some of the monstrous gaps observable in the chain of species. The physical

changes perpetually occurring in the condition of the earth's surface, render large tracts of land incapable of sustaining any longer certain species which formerly hid the soil with their luxuriant foliage: we know that thousands of such species did exist, and do not exist; but that their history is preserved for ever in Geology, that glorious book whose pages are traced by Nature's own hand upon tablets of adamant. The hypothesis that Nature is compensating her losses by new creations, requires the recommendation of proof. All our Floras tell a different tale. The links which once connected Equisetum to Chara or to Isoëtes have since perished, and no others have been supplied; so that those genera stand alone and insulated, while all around them has disappeared: just as solitary specks of uninhabitable land, peeping up in the boundless ocean, are said to testify of a continent submerged. Whoever reads these circumstances aright, will fully appreciate the difficulty under which those are labouring who endeavour to build a system of such scanty materials. Deeply impressed with this difficulty, I have thought it better to preserve intact the arrangement which I originally proposed, than to attempt a new one; at the same time giving an outline of a plan which I believe more in accordance with Nature.

"It may here be observed, that in the various systems proposed or indicated by general botanists, as Ray, Linneus, Antoine de Jussieu, Agardh, Perleb, Dumortier, Bartling, Hess, Schultz, Fries, Endlicher, Brongniart, Meisner, Adrian de Jussieu, and Lindley, there is a most evident tendency to depreciate, or rather to under-estimate, the flowerless plants. Whether they were called simply "flowerless," as by Ray; "Cryptogams," as by Linneus; "Acotyledons," as by the elder Jussieu and Decandolle; little has been done beyond the mere change of name. All these authors appear either to ignore or to disregard the extreme fallacy of divisions founded on a mere positive and negative. Nothing is more simple than the division of all plants into those which *have* flowers, and those which *have not:* but something more is required, for positive and negative characters might be made the basis of the most unnatural divisions.

"Cuvier, in his 'Animal Kingdom,' a work unapproached, perhaps unapproachable, in its masterly and philosophical grouping, has shown the plans on which all animals are constructed. He ignores the positive and negative of vertebrate and non-vertebrate, and employs positive characters only in defining his divisions; these are Vertebrates, Mollusks, Articulates, and Radiates: and a little reflection will convince any botanist that there are four great divisions of

plants, equally capable of being distinguished by positive characters; these are Exogens, Endogens, Acrogens, and Thallogens.

"Acrogens, in common with Thallogens, are without flowers; 'nothing can be found which resembles the stamens and pistils of flowering plants:' they have usually distinct roots, stems, and leaves, the two halves of the latter being generally symmetrical; these characters serving at once to distinguish Acrogens from Sea-weeds, Lichens, or Fungi. Interesting as are the discoveries which Nägeli and his followers have made on the pro-embryo of ferns, and which I had the pleasure of introducing to the notice of British botanists (Phytol. iii. 613 and 925), their bearing on the diagnostic characters of Acrogens has been wholly misunderstood. Abundant evidence exists that there is in these discoveries no contradiction to the assertion, that Acrogens, so far as our researches have extended, are perfectly asexual.

"Acrogens are either vascular and Pteridoid, or cellular and Mnioid: the first including all ferns and their allies, and the last, all mosses and their allies. The allies of ferns are Lycopodiums, Quillworts, Pill-worts, Marsilias, Equisetums, and Charas: they have sometimes been called Cryptogamic Vasculares; but I prefer to define and divide them in the following manner, which, it will be observed, strikingly differs from the most popular and most recent arrangements. The division of the Filicales splits the universally received genera of Pteris, Polypodium, Asplenium, Davallia, and many others.

"ACROGENÆ PTERIDOIDÆ, Pteridoid Acrogens, or Ferns and their allies, are plants of vascular structure, but which produce fruit without preliminary flowers: they may be divided thus:—

FILICALES [or annulate Ferns] have distinct leaves bearing one-celled capsules which are encircled by an elastic ring: they comprise:—

RHIZOPHYLLACEÆ, in which the leaves are attached to a rhizome or root.

CORMOPHYLLACEÆ, in which the leaves are attached to a cormus or trunk.

OSMUNDALES [or exannulate Ferns] have distinct leaves and one-celled capsules detached from the leaves, and not encircled by an elastic ring: they comprise:—

OSMUNDACEÆ, in which the vernation of the leaves is cicinate and the trunk woody.

OPHIOGLOSSACEÆ, in which the vernation of the leaves is straight and the trunk succulent.

LYCOPODIALES have distinct leaves and capsules divided by one or more septa: they comprise:—

MARSILIACEÆ, in which the capsules are attached to the rhizome or root.

LYCOPODIACEÆ, in which the capsules are seated in the axils of the leaves.

EQUISETALES have no leaves, but consist of an articulated branched stem: they comprise:—

EQUISETACEÆ, in which the fructification forms a terminal spike.

CHARACEÆ, in which the fructification is seated in the axils of the branches.

"It will be seen that the divisions Rhizophyllaceæ and Cormophyllaceæ have a great similarity to those proposed by Mr. John Smith, of Kew, under the names of Eremobrya and Desmobrya. I believe the idea of using this character as one upon which to found a primary division of the annulate ferns originated with myself, (see Phytol. ii. 273); but Mr. Smith was the first to apply the idea, and to name divisions founded on the differences pointed out. It must, however, be observed, that Mr. Smith, in his primary divisions, lays great stress on a character which now appears to me of somewhat secondary importance: I allude to the articulation of the stipes to the rhizome. My own conclusion, from a careful examination of the species within my reach, is, that the grand distinctive characters are these:—*First*, that the rhizome of the Rhizophyllaceæ, and the caudex of the Cormophyllaceæ, are not the same organ: that the rhizome is a root; the caudex a stem: that the rhizome never terminates in a frond; that the caudex always does: indeed, that its apex is constituted of fronds undeveloped; its trunk, of the bases of fronds that have decayed. *Secondly:* that the growing apex of a rhizome is always in advance of the fronds; that the fronds are always in advance of the growing apex of a caudex. There are two other and possibly less constant diagnostics: the rhizome of the Rhizophyllaceæ is scaly, the stipes naked; the caudex of the Cormophyllaceæ is naked, the stipes densely paleaceous: the formation of the fruit of the

Rhizophyllaceæ follows the development of the frond; in the Cormophyllaceæ it precedes it. In some Cormophyllaceæ there is a tendency to approach the Rhizophyllaceæ: this is strikingly the case in Dryopteris, Phegopteris, and Thelypteris; but it is only necessary to examine the growing apex of the rhizomatiform caudex of these well-known ferns, in order to ascertain that it is always composed of undeveloped fronds. There is a plant familiar to every one who has a garden, that affords an illustration of the two modes of growth,—the common Pyrus japonica. The branches of this beautiful shrub always terminate in a bud, composed of undeveloped leaves; such branches, therefore, are analogous to the caudex of a cormophyllaceous fern: the roots, on the contrary, spreading horizontally, and near the surface of the ground, never terminate in leaves, but possess the power of originating leaves and leaf-branches at any part of their surface except the growing apex; and not leaves only, but flowers also: such leaf-bearing roots are striking analogues of the rhizome of rhizophyllaceous ferns. Could we therefore divide a Pyrus japonica into branches and roots, we should have representatives of these divisions of ferns: the branches would be cormophyllaceous, the roots rhizophyllaceous."—P. vii.

The generic names have undergone considerable change:—

Lomaria spicant of 2nd edit.	=	Blechnum spicant of 3rd edit.
Pteris aquilina	=	Eupteris aquilina
Polypodium vulgare	=	Ctenopteris vulgaris
„ Phegopteris	=	Gymnocarpium Phegopteris
„ Dryopteris	=	„ Dryopteris
„ calcareum	=	„ Robertianum
Lastrea Thelypteris	=	Hemestheum Thelypteris
„ recurva	=	Lophodium fœnisecii
„ multiflora	=	„ multiflorum
„ spinosa	=	„ spinosum
„ cristata	=	„ Callipteris
„ rigida	=	„ rigidum
„ Filix-mas	=	Dryopteris Filix-mas
Asplenium Ruta-muraria	=	Amesium Ruta-muraria
„ germanicum	=	„ germanicum
„ septentrionale	=	„ septentrionale
Scolopendrium vulgare	=	Phyllitis Scolopendrium
Ceterach officinarum	=	Notolepeum Ceterach

The new genera Ctenopteris, Eupteris, and Gymnocarpium, became necessary in consequence of the primary division of the Filicales above set forth: Hemestheum, Phyllitis and Notolepeum have received names in order that the Linnean names Thelypteris, Scolopendrium and Phyllitis might be restored to the species; these three genera were previously established: Blechnum spicant is a restoration of a Linnean name; Dryopteris Filix-mas is adopted from Schott; no other British fern has the complete reniform involucre of this species: Lophodium is new, and instituted because the species have been placed indifferently in either of the overwhelming genera Polypodium, Polystichum, Aspidium, Nephrodium or Lastrea, and, as we think, with increasing impropriety as we advance chronologically from the first to the last. Polypodium is least objectionable because it is only too comprehensive; Lastrea is most objectionable, because instituted by its learned author PURPOSELY TO EXCLUDE THEM: and he has framed his character with such skill and care that this object is effectually accomplished: Amesium is a mere division of Asplenium; whether it be desirable to divide that huge genus by a clear and unmistakeable character we leave others to judge.

In specific names we have many changes: Britain is a powerful nation, and perhaps withal a little self-satisfied, and there are those of its scientific sons who regard it as somewhat dignified to maintain a nomenclature of our own, and to be very indifferent as to its agreeing with that of our continental neighbours. If the name of a worthy man has been attached to a species, or if any name has been attached by a worthy man, it matters nothing at all that that species had a prior name universally received. All our authors are aware that the names unilaterale, Robertianum, and several others are thus situated, and yet they preserve the insular names from a feeling of nationality; Wilsoni, because Mr. Wilson is a worthy man, and because it was given by Hooker, another worthy man; calcareum because it was given by Smith, and so on with the rest. Alas! shall we never admit the catholicity of science!

'*First General Report of the Government Botanist on the Vegetation of the Colony of Victoria*,' *dated September*, 1853, *and Printed by order of the Council.*

This very excellent report has been most obligingly placed in our hands by Dr. J. M. Barry, of Tunbridge Wells, with permission to reprint the whole or any portion in the 'Phytologist.' At a moment when we are looking on Victoria simply as the source of unbounded wealth, and turning a deaf ear to all merits and demerits that do not issue in the magical word "gold," it is really refreshing to find science pursued with perseverence, zeal, and ability, even though an individual follow his vocation, as in this instance, alone. The 'Phytologist,' intended for, and almost confined to, the Botany of Britain, may, nevertheless, without incurring just censure, extend its scope to her colonies, or even to foreign lands; and we feel persuaded that we shall be performing an acceptable service to botanists if we lay before them the following "Report" entire.

"In obedience to His Excellency's command, I have the honour to transmit to you my General Report, partly compiled from those documents which I forwarded on several occasions during my journey, from February until June last, and partly resting on the subsequent examination of the specimens which I brought home.

"Before I enter into any details on the classification of our indigenous vegetable world, on its relation in comparison with the plants of the adjacent countries, and on the practical uses to which we might possibly apply many of its productions, it may be considered necessary to delineate the route which I pursued during my last expedition.

"I proceeded, at first, with deviations from the usual road wherever it appeared favourable for my pursuits, to Futter's Range, which rears, like some other granitic mountains in its vicinity, a host of very peculiar plants. Thence I directed my course to May Day Hills, from which place I advanced, after a brief stay, to the Buffalo Ranges, where I ascended Mount Aberdeen and another peak more than 4,000 feet high, and examined the rich, almost tropical, vegetation which borders the rivers rising in these mountains. It was in this locality that our exertions were rewarded with the discovery of the high, majestic Grevillea Victoriæ, and other rarities. Indications of gold have been observed here, as well as in some parts of Gipps' Land

which I subsequently visited. The Superintendent of the Melbourne Botanic Gardens, who was engaged during this part of the journey in collecting seeds, here parted from me, being obliged to return homeward to resume his duties at the Botanic Gardens.

"As Mount Aberdeen offered hardly any plants of a true Alpine character, I resolved to ascend Mount Buller, whose summits, at an elevation of more than 5,000 feet, are covered throughout the greater part of the year with snow. Travelling quite alone since leaving the Buffalo Ranges, the ascent was not accomplished without considerable danger. But I was delighted to observe here, for the first time, this continent's Alpine vegetation, which in some degree presented itself as analogous with the Alpine Flora of Tasmania (Ranunculus Gunnianus, Euryomyrtus alpina, Celmisia astelifolia, Gentiana Diemensis, Podocarpus montana, Trisetum antarcticum, &c.), and which was also by no means destitute of its own peculiar species (Phebalium podocarpoides, Goodenia cordifolia, Hovea gelida, Oxylobium alpestre, Brachycome nivalis, Anisotome glacialis, &c.) Remarkably enough, only one of these exhibits any similarity to the singular subalpine forms discovered by Sir Thomas Mitchell on the Australian Grampians. Mount Buller had never before been scientifically explored; and Mount Aberdeen, up to this time, had not even been ascended.

"After some other less elevated mountains in the neighbourhood had been also botanically examined, I resumed my journey along the Goulburn River and some of its tributaries to the King Parrot Creek, where I crossed the Yarra Ranges. The unusually heavy rainfall in the autumn would have frustrated any attempt to reach, as I then contemplated, the Alpine mountains of Gipps' Land, and I considered it therefore more advisable, at the already advanced season, to devote my time rather to the examination of the maritime plants which are in an almost equal state of development throughout the year.

"I went, accordingly, for some distance along the La Trobe River, to the south-eastern coast of Gipps' Land, passing some rich ravines, luxuriantly filled with two species of fern tree, Alsophila Australis and Dicksonia antarctica; the former of which seemingly never accompanies the Dicksonia far inland, but remains in those valleys which slope towards the sea. Notwithstanding these geographical limits, the Alsophila, occupying generally the drier localities on the hills, recommends itself better for transplanting.

"After several weeks' travelling in the neighbourhood of Port

Albert, and many excursions through Wilson's Promontory, I quitted Gipps' Land, returning homeward along the coast.

"This journey, the lines of which extended over more than 1,500 miles, enriched my collections formed during the spring so far that they comprise probably now more than half the indigenous vegetation of this Colony. For, according to the Index which I have annexed, including also several plants discovered previously by Sir Thomas Mitchell and by His Excellency the Lieutenant Governor, there are known to me now already 715 species of Dicotyledoneæ, belonging to 286 genera and 83 natural orders; 201 species of Monocotyledoneæ, comprehending 100 genera and 21 natural orders; and 47 ferns, containing 27 genera. About fifty other species, however, which I have not included in this general account, are not yet so exactly examined as to receive their true systematic position, and are consequently not enumerated in the list; while fifty others, not indigenous, but introduced species, are likewise not taken into account, although they are not only naturalized beyond the possibility of extirpation, but even overpower the more tender indigenous plants. I regret that I was also obliged to omit from this Index all the lower Acotyledoneæ (mosses, Lichenistra, lichens, Algæ, and Fungi), to the amount of at least 200 species, of which I could examine this winter too few to display them in a systematic arrangement. The full amount of species, therefore, considerably exceeds 1,100, belonging, with exclusion of the above-mentioned Acotyledoneæ and the foreign plants, to no less than 430 genera and 108 natural orders—proportions which far surpass those of Western Australia, where more than twice this number of species (according to the collections of Dr. Preiss) are only divided into exactly the same number of genera already discovered here (430), and only into 91 families.

"The Index might have been increased without difficulty to a two-fold number of names; but through a long-continued examination of the Australian plants in a living state, I had the advantage of learning how great is the uncertainty of many characteristics, which are deemed, even by our greatest authorities in science, sufficient for distinction. According to the annexed enumeration, the proportion of the Dicotyledoneæ to the Monocotyledoneæ will be found, for that part of the country over which my investigations this year extended, nearly as seven to two, and corresponds, therefore, exactly with the position which these great divisions of the vegetable kingdom hold to each other in South Australia up to the thirty-fourth degree South latitude (as shown in my observations on the South Australian Flora, lately

read before the Linnean Society of London), and holds, likewise, the mean between the proportions ascertained by Robert Brown for Van Diemen's Land and New South Wales; while in Western Australia, as well as in South Australia, including the country there to the thirty-first degree South latitude, the number of the Dicotyledoneæ exceeds in the proportion of nine to two that of the Monocotyledoneæ.

"The Cryptogamic plants, however, favoured by a more humid atmosphere, are twice as numerous in our province as in the last-mentioned Colonies, being about equal to a third of the Dicotyledoneæ.

"Excluding all Cryptogamic plants, not less than 200 species, as testified by the Index, are proved to be as yet undescribed. Some of these occurred to me in South Australia; and the descriptions of several others will probably find a place in Dr. J. Hooker's forthcoming 'Flora of Van Diemen's Land.' These novelties enabled me already to establish seven new genera (Pseudomorus, Basileophyta, Phæoleuca, Tetrachæta, Minuranthus, Psoraleopsis, and Rhytidosporum).

"The descriptions, not only of almost all the new plants, but also critical notes and observations on the phytogeographical range of the species already known, will be forwarded to Sir William Hooker before my departure for the interior, and will afterwards constitute, together with the scientific elucidations of such plants as may be added during the ensuing season from the yet botanically unexplored districts, the foundation of 'The Flora of Victoria.'

"That the vegetation of the southern parts of our province accords greatly with the Tasmanian Flora may be demonstrated by the fact that more than half of all the enumerated species are known to inhabit Van Diemen's Land, amongst them many of great interest, which had been considered as belonging exclusively to that island, some adding even new genera to the Flora of New Holland (Fagus Cunninghami, Bauera Billardierii, Tasmania aromatica, Weinmannia biglandulosa, Pleurandra monadelphia, Ranunculus Gunnianus, Capsella Australis, Pittosporum bicolor, Rhytidosporum procumbens, Rhytidosporum Stuartianum, Boronia dentigera, Eriostemon verrucosus, Corræa Backhousiana, Meionectes Brownii, Bossiæa horizontalis, Brachycome decipiens, Celmisia astelifolia, Scævola Hookeri, Monotoca lineata, Lissanthe montana, Lissanthe ciliata, Prostanthera rotundifolia, Myosotis suaveolens, Wilsonia Backhousii, Gentiana Diemensis, Sebæa albidiflora, Hakea microcarpa, Podocarpus montana, Phyllanthus Gunnii, Micranthea hexandra, Diplarrhena Moræa,

Uncinia tenella, Triodontium Tasmanicum, and a great number of ferns).

"No numerical comparison with the Flora of South Australia and New South Wales has been instituted, as those localities are not sufficiently examined which bear, perhaps, in this respect, as great a resemblance to the adjacent Colonies as the southern tract of this province bears to Van Diemen's Land.

"Still, there remains yet a considerable number of plants which impress on our vegetation a type of peculiarity; and I may be permitted, for this reason, to call attention to our remarkable species of Panax, resembling mainly those of the Moluccas; to Trigonella suavissima, as the only Australian clover; to the species of Psoralea and to Crantzia, as connecting links with the American Flora; to Pseudomorus Australasica, the indigenous mulberry tree; to Myrsine Howittiana, nearer connected with the New Zealand species than with those of New South Wales; and to the Alpine Anisotome glacialis, as a genus from Auckland and Campbell's Islands.

"With regard to the Phytogeographia of this country, it may be deemed worthy of notice that, in the arid steppes beyond the Glenelg River, the vegetation undergoes a remarkable change, and a large number of such plants as are common to Victoria, New South Wales, and Van Diemen's Land, cease to exist, not even re-appearing farther to the westward, where the physical character of the country assumes once more equality or similarity to the eastern provinces. Others, again, extend the geographical limits of certain genera or species which we thought to belong entirely to Western Australia: thus, for instance, Thomasia petalocalyx and Coleostylis Preissia range to the 148th meridian.

"It may also be worthy of remark, that the order of Leguminosæ prevails decidedly here, as in Western Australia, over all others; and that the Compositæ, far exceeding in South Australia, and almost throughout the world, any other groups, rank here as the second order. Both, taken together, show such eminent richness as to comprise nearly a fourth of all Dicotyledonar plants. The most predominant natural orders exhibit here, with regard to their number of species, the following series:—Leguminosæ, Compositæ, Myrtaceæ, Algæ, Filices, Cyperoideæ, Gramineæ, Musci, Proteaceæ, Orchideæ, Epacrideæ, Fungi, Umbelliferæ, Diosmeæ, Liliaceæ, Lichenes, Labiatæ, Goodeniaceæ, Scrophularinæ, and Salsolaceæ.

"Finally, and perhaps as to the most important point of my researches, I have to reflect upon the practical usefulness of our vege-

table creation, either with regard to medicine, manufactures, or in a domestic point of view.

"The inestimable truth, that we may safely deduct the closest affinities of the medicinal properties of plants from their natural alliances —a truth which achieved the most complete triumph of the natural system over all artificial classifications—has generally guided me in tracing out which plants might be administered in medicine. By this guidance I observed, that our Pimeleæ are pervaded by that acridity for which the bark of Daphne Mezereum is employed; that our Polygala veronicea, the only described Australian species of a large genus, and in close relation to one lately discovered in the Chinese empire, not only agrees, like some kinds of Comesperma, with the Austrian Polygala amara, in those qualities for which that plant has been administered in consumption, but also participates in the medicinal virtue of Polygala senega, from North America. Gratiola latifolia and Gratiola pubescens, Convolvulus erubescens, and the various kinds of Mentha, are not inferior to similar European species. The bark of Tasmania aromatica appears to me to possess the medicinal power of the Wintera bark, gathered from a similar tree in Tierra del Fuego; and its fruit is allied to that of the North American Magnoliæ used in cases of rheumatism and intermittent fever. The whole natural order of Goodeniaceæ, with the exception, perhaps, of a few species, contains a tonic bitterness never recognized before, and discernible in many plants in so high a degree, that I was induced, for this reason, to bestow upon a new genus from the interior the name of Picrophyta; this property, which indicates a certain alliance to Gentianeæ, deserves the more consideration, as the true Gentianeæ are so sparingly distributed through Australia, while the Goodeniaceæ form everywhere here a prominent feature in the vegetation. Our Alps, however, enrich us also with a thick-rooted Gentian (*G. Diemensis*), certainly as valuable as the officinal Gentiana lutea; and in the spring, Sabæa ovata, Sabæa albidiflora, and Erythræa Australis, might also be collected on account of their bitterness. The bark of the Australian Sassafras tree (*Atherospermum moschatum*) has already obtained some celebrity as a substitute for tea;—administered in a greater concentration, it is diaphoretic, as well as diuretic, and has for this reason already been practically introduced into medicine by one of our eminent physicians. Isotoma axillaris surpasses all other indigenous Lobeliaceæ in its intense acridity, and can be therefore only cautiously employed instead of Lobelia inflata. The root of Malva Behriana scarcely differs from that of Althæa officinalis, and the Salep

root might be collected from many Orchideæ. Few may be aware that the Cajeput oil of India is obtained from trees very similar to our common Melaleucæ; and that even from the leaves of the Eucalypti an oil can be procured of equal utility. The Sandarac, exuding from the Callitris or pine tree, the balsamic resin of the grass trees, and, moreover, the Eucalyptus gum, which could be gathered in boundless quantities, and which for its astringent qualities might here at least supersede the use of kino or catechu, will probably at a future period form articles of export.

"Several Acaciæ are of essential service, either for their durable wood, or for the abundance of tannin in their bark, which has rendered them already useful, or for their gum; but the latter is even excelled in clearness and solubility by that obtained from Pittosporum acacioides. This species, as well as many other plants of the same order, is distinguished by a surprising yet apparently harmless bitterness — a quality that warrants our expecting considerable medicinal power, and which deserves so much more attention, as till now we know nothing of the usefulness of the Pittosporeæ, although this order extends over a great part of the eastern hemisphere.

"The Australian Manna consists in a saccharine secretion, condensed chiefly by the Cicades from a few species of Eucalypti, but is chemically very differently constituted to the Ornus Manna, and much less aperient. All our splendid Diosmeæ—a real ornament to the country—approach more or less in their medicinal effect to the South African Bucco-bushes.

"Bæckea utilis, from Mount Aberdeen, might serve travellers in those desolate localities as tea, for the volatile oil of its leaves resembles greatly in taste and odour that of lemons — not without a pleasant, peculiar aroma. Trigonella suavissima proved valuable as an antiscorbutic spinage in Sir Thomas Mitchell's expedition; and the Tetragonella implexicoma, the various Cardamines, Nasturtium terrestre, or Lawrencia spicata, may likewise be used for the same purpose. The root of Scorzonera Lawrencii—a favourite food of the natives—would form, if enlarged by culture, an agreeable substitute for Scorzonera Hispanica, or Asparagus; and Anistome glacialis—a large-rooted umbelliferous plant, from the snowy top of Mount Buller—will be added, perhaps, hereafter, to the culinary vegetables of the colder climates. Seeds of the latter plants, amongst many others, have been procured for the Botanic Gardens. Santalum lanceolatum, Mesembryanthemum æquilaterale, Leptomeria pungens, and Leptomeria acerba, deserve notice for their agreeable fruit.

"It would lead too far to enumerate the numerous modest, but lovely, or even the more attractive ornamental plants, which will no doubt hereafter contribute to adorn the gardens here and at home. Still, in a general sketch of our vegetation, I ought not to pass unmentioned, in this regard, the magnificent Grevillea Victoriæ; the splendid parasite of the fern tree, Basileophyta Friderici Augusti, on which the name of the royal botanist has been bestowed; and the grand Corræa Latrobeana, — three of the most gorgeous plants discovered during my last expedition.

"In accordance with His Excellency's instructions, a collection of dried specimens of plants has been commenced for the Government. This Herbarium will be at all times accessible to the public, and will hereafter contribute, I trust, to diffuse, more and more, knowledge of our vegetable world, and excite lovers of natural science to assist in my investigations. I began to form, at the same time, a similar collection for the Royal Gardens at Kew.

"I am happy to report that the Botanic Gardens are in a very prosperous state, and that the establishment does great honour to the able management of its Superintendent. The addition of a large greenhouse, which His Excellency has been pleased to sanction, upon the recommendation of the Committee, will be most useful as a receptacle for tropical productions; and a considerable piece of ground has been prepared, this year, to rear all the seeds which have lately been collected for the garden, or which were liberally presented.

"The Committee deemed it also advisable that an iron foot-bridge for crossing the Yarra should be procured from home, to afford an easier access to the Garden for the inhabitants of the eastern part of Melbourne; and by this means the number of visitors — already (chiefly on Sundays) very considerable — will, doubtless, greatly increase.

"I trust, therefore, that the Botanic Gardens, as an establishment so desirable for the diffusion of knowledge, for the experimental introduction of foreign plants into our adopted country, or for multiplying the treasures which our own Flora offers, and as a healthy locality for recreation, will continue to receive the support of the Government and the Legislature; and I hope that, by still further extending the communications of this establishment with the Botanic Gardens of other countries, we shall succeed in keeping pace with the general advance of this great and flourishing country."

A second paper, intituled 'Botanical Report, by William Swainson, Esq., F.R.S.,' is also in our hands; and, we regret to say, is, to ourselves, exceedingly unsatisfactory. Mr. Swainson gives a list of two hundred and thirteen species of Cassuarinæ, of which five only are marked as undetermined; all the rest having Latin as well as English names. It would appear, from the heading of the list, that all these species are new to science, "List of species of Cassuarinæ, or Australian Pines, discovered, named, and described by Mr. Swainson."

Subjoined is Mr. Swainson's report, which we leave without comment; being unwilling, on the one hand, to commend what conveys with it so little of the appearance of solid information; and, on the other hand, being particularly anxious to avoid prejudging a matter of which we confess ourselves to be very ignorant. We sincerely hope Mr. Swainson's researches may prove to be as carefully conducted as their results appear to be marvellous. We may, perhaps, be allowed to remark that the title is scarcely precise: should it not rather run thus:—"Report on Eucalyptidæ and Cassuarinæ"?

"I do myself the honour of laying before your Excellency, in the enclosed papers, the result of my botanical investigations in this province.

"My chief attention, for the first five months after being located here, was directed to the family of Eucalyptidæ, or gum trees, among which I have discovered five distinct and well-marked genera, hitherto unknown as such, and apparently peculiar to Victoria; together with two other new genera, which occur also in the adjacent province.

"Having had no accommodation for arranging the different species for comparison, &c., I have been necessitated to pack them up as fast as collected. It is quite impossible, therefore, for me to state, with any degree of certainty, the number of new species contained in the above genera. The packets of dried specimens, seeds, and capsules, will be seen to form a grand total of 1520. I am therefore disposed to think, that even if two-thirds may hereafter prove varieties only, there will yet remain more than 500 species, botanically distinct, only two or three of which I have found in New South Wales.

"My researches, in respect to timber trees (from causes already well known), have been quite unsuccessful. The red gum (*Canthocarpus*, La.), and the straight stringy bark (*Tricanthus*, La.), are the only genera I have found whose wood is useful either for sawing or splitting. Specimens of the former (of an unknown species), have been procured and sent to the curator. The latter, of which there are

numberless species, and a few of that of Microcarpus, or native box, are mostly used for fencing.

"No reasonable doubt, however, can be entertained, that other parts of the province are more productive than this seems to be of valuable timber; and as the Colonial Botanist has had the requisite facilities at his disposal for ascertaining this fact during his extensive excursions, he will doubtless have succeeded far better than myself in developing the *economical* properties of the Victoria timber trees.

"During the last year I have made various attempts and experiments to discover the principles of variation amongst the Cassuarinæ, vulgarly called he and she oaks, but which in reality are the true pines of Australia. It was only in June last, however, that this discovery was effected, and the conviction then arrived at that all the descriptions now existing were perfectly and essentially defective, and therefore *quite useless;* and that this and the genus Exocarpus are the most extraordinary groups of trees yet discovered in Australia. Without being further tedious (as I intend to bring this discovery before the public in another shape), I shall merely state to your Excellency, that the facts I am prepared to bring forward will establish the following propositions:—

"1. That the Australian pines belong more to a very remote or primeval Flora than to the present.

"2. That they are slowly, but *surely*, *disappearing* from the face of the earth, and giving place to that comparatively recent order of vegetables which springs up in their stead. In this respect they offer a wonderful analogy to what we have ourselves witnessed in regard to the aboriginal tribes of Australia now giving place to those of the Caucasian race.

"Now, of this remarkable tribe I have succeeded in determining more than *two hundred* species, all still growing within a very short distance of this place, besides having met with several others in different stages of decay, but which, from their bark and other indications, convince me were different from all those I have met with in a *growing* state. They have, in fact, died from excessive age, and have left no successors.

"In the accompanying paper is a list of all the species found by me up to the end of the last month, and an abundance of cones of nearly all these have been collected and sent to the curator of the Botanic Garden. These your Excellency may now cause to be distributed and made known over the whole civilized world: and thus the Botanical Garden would probably receive from those established

at the Cape, Rio de Janeiro, Calcutta, Ceylon, &c., &c., more rare and costly plants, in exchange, than would fill five such conservatories as that now building in Melbourne.

"I should also suggest, that as most of the species are handsome, and many beautiful, growing trees, half an acre or so of ground be appropriated for a seed-bed, by which a large number of young plants might be raised, ready to transplant into the projected shrubberies round the Government House, and to distribute among such private individuals as may wish to possess some few examples of these aborigines of the vegetable world.

"To establish these discoveries upon the most solid basis, I have given up nearly a month of my engagement with the Tasmanian Government, for, without having laboured, I may say truly, both day and night, for the last three months, I could not have brought the matter to such an unquestionable issue. Without taking too much credit to myself, I feel satisfied that these discoveries will be regarded with as much surprise and almost incredulity amongst the botanists of Europe, as was that of gold in Australia among the geologists of Britain.

"Of all those named in the list I possess elaborate descriptions, partly written with the trees before me, and finished before the cones had opened, and thus lost their specific characters. As there exists no scientific society or other medium for publishing an essay on these trees in Melbourne, I think the Royal Tasmanian Society (of which I am an honorary member) will gladly do so in their own Transactions."

Proceedings of Societies, &c.

The Phytologist Club.

One Hundred and Fifty-Seventh Sitting.—Saturday, May 20, 1854.—Mr. Newman, President, in the chair.

The President read the following communications :—

Botrychium rutaceum, Sw.

"At page 131 of the present volume of the 'Phytologist' I am in effect blamed for taking no notice of B. rutaceum as a British plant.

The fact is, that I had never either seen or heard of a native specimen until the appearance of that number; and Messrs. Hooker and Arnott seem to be in the same position. Smith's remark led me to believe that it was only some accidental variation that was intended by him; and Fries's note upon B. rutaceum seemed to show that such was also the fact in other countries. Is the figure upon page 133 taken from a British specimen? Ray and Dillenius do not appear to have known so much about it as Mr. Newman supposes; for we learn from the 2nd edition of Ray's 'Synopsis' that the part of the quotation enclosed in brackets () is not a remark of either Ray or Dillenius, but of Doody, with the exception of the sentence beginning 'Est' and ending with '288,' which Dillenius added. In the present state of the question I shall not venture to give any opinion.—*Charles C. Babington.*

Carex Mœnchiana.

"It is many years since I received a considerable number of specimens of Carices from the late Mr. S. Gibson, who was well known for his acuteness in detecting and discriminating plants. Amongst them I find two specimens of the plant named by him C. Mœnchiana, on the authority, as he supposed, of Dr. Boott. Since receiving the plant, I have submitted it to the examination of that eminent botanist, and find, from the note written upon the paper, that he thinks it is—

'Vulgaris forma. F. B.'

The specimens are very young, having the anthers only just bursting; and I do not see any reason to doubt the correctness of Dr. Boott's last determination. The true C. Mœnchiana is probably a form of C. acuta."—*Id.*

Botanical Society of Edinburgh.

April 13, 1854.—Professor Balfour, President, in the chair.

Donations.

To the Library:—From the Liverpool Philosophical Institution, their 'Proceedings;' from Arthur Henfrey, F.L.S., his papers on the Reproduction of Ferns from their Spores, and on the Development of Marchantia polymorpha; from Dr. Johnstone, Berwick-on-Tweed, his 'Natural History of the Eastern Borders.'

To the Museum of Economic Botany: — From Mrs. Miller, Edinburgh Castle; William Ivory, Esq., St. Roque; W. H. Macfarlane, Esq.; Thomas Hay, Esq., Prospect Bank, Leith; Miss Yule, Inverleith Row; Dr. Balfour; Professor Treviranus, Bonn; the Oregon Association; Rev. Mr. Waddell; Dr. Greville; Mr. David Kerr.

Professor Balfour announced the presentation to the Herbarium at the Botanic Garden, of a set of the specimens recently received by the Oregon Association, from their collector Mr. Jeffray.

Exhibitions.

Professor Balfour exhibited the male cone of a Cycadaceous plant, sent by Dr. Stanger from Natal, and named conditionally by Mr. Smith, of Kew, Stangeria paradoxa. The cone had been sent under the name of Lomaria eriopus, picked by Gueinzius at Port Natal, and details in regard to it and the plant have been recently given by Mr. Smith in Hooker's 'Kew Miscellany.' The leaves have a fern-like appearance, and are very like those of a Lomaria or Danæa. The vernation is inflexed and involute, and the forked veins come from a true mid-rib. Mr. Smith remarks that the latter circumstance shows the untenable nature of the characters distinguishing fossil Ferns and Cycads.

Professor Fleming noticed the occurrence of a remarkable white fungoid production on the roof of a dark cavern excavated for fire-clay in the sandstone quarry at Joppa, near Edinburgh. It seemed to be the mycelium of a fungus originating in the wood which propped up the roof of the mine. The white mass was seven feet in diameter. Some of the threads were pendant from the roof, and others had dropped on the floor of the mine. Dr. Macbean had examined the substance with a microscope, and found it to be composed of numerous cells arranged in a bead-like manner, but he was not able to detect fructification or spores.

Mr. M'Nab exhibited specimens of Lathræa squamaria collected by Mr. Peter Paisley, in a wood about a mile from Galashiels.

Professor Balfour exhibited, from Messrs. P. Lawson & Son, specimens of glass labels for plants.

Mr. G. Lawson exhibited, under the microscope, preparations of the colouring matters of the flower of Strelitzia Reginæ, and drawings of the same. This plant is interesting as presenting examples of both the xanthic and cyanic series in the same flower, but still more remarkable in the microscopical peculiarities of its colouring matters, which are referred to by Mohl in the 'Vegetable Cell,' (p. 44). Mr.

Lawson stated that in the blue (or purplish blue) part of the flower, the colouring matter entirely consists of spherical granules of an intense blue or bluish purple colour, with occasionally cells containing similar shaped granules of bright crimson. All the granules of any one cell appear to be constantly of the same colour. In the yellow part of the flower, the colouring matter appears in a very different form. Instead of spherical granules, we have slender filaments, which are more or less spirally twisted and rolled up in various ways in the cell, resembling in their twisting the more delicate spiral fibres in the external cells of the roots of epiphytal Orchids; but they are in many cases short, and form small round coils, giving the outline of globular bodies, which likewise, however, occasionally occur. While red and blue colouring matters usually occur in the vegetable kingdom diffused in the cell-sap, we find them both in Strelitzia in a globular form. Although deceptive appearances often presented themselves, Mr. Lawson felt inclined to believe from the examination of numerous specimens, that diffused colour did not at all occur in the flowers of Strelitzia. When the flower has attained its maturity, however, the cells are often so completely filled with the deep blue granules that they appear as a dense mass of blue, apparently homogeneous, matter in the interior of the cell. The flower should therefore be examined in the young state, not only before it has expanded, but long before the spathe has opened to expose it to the action of the light; even then the colouring of the flower will be found to have far advanced, but the cells not so completely filled with the blue globular granules as to disguise their character, and they are therefore distinctly seen. The cells containing the yellow filaments are generally of larger size and more elongated in form than those containing blue or red globules. The flowers examined by Mr. Lawson had been obtained (through the kindness of Mr. Evans) from a large specimen in the Experimental Garden.

Mr. G. Lawson exhibited specimens of Hypnum salebrosum, collected on an old wall at Baldovan, near Dundee, in March last, by Messrs. Ogilvie & Hutton. He stated that the plant had not previously been known in the county of Forfar since Drummond's time.

Polypodium alpestre at Clova.

Professor Balfour stated that Mr. Croall, of Montrose, in a recent account of a trip to Clova, published in Hooker's 'Kew Miscellany,' had remarked :—" Polypodium alpestre at the head of the glen grows

side by side with Lastrea dilatata, but I nowhere observed Athyrium Filix-femina associated with, or at the same elevation as Polypodium alpestre." This statement was not in accordance with what was observed by Dr. Balfour and his party during their trip to Clova at the beginning of August last. They found Athyrium Filix-femina and Polypodium alpestre growing together, both in Glen Fiadh and in Glen Dole. In many instances it was necessary to look at the fructification, in order to avoid picking the one for the other. At the head of Glen Dole, and above the path called Jock's Road, both ferns grew luxuriantly. Polypodium alpestre descends much lower than has been supposed. It was found at little more than fifty feet above the Dole, on the bank below the Astragalus alpinus cliff.

Mr. G. Lawson remarked that a statement similar to that of Mr. Croall had been made to him last summer, and he was thus led to pay particular attention to the point when he visited Clova as one of Professor Balfour's party. Such statements were quite at variance with obvious facts, the Athyrium being a frequent associate of Polypodium alpestre. This circumstance, together with the variability of both plants (whose respective varieties are in some cases very similar to each other), rendered it often difficult to distinguish the one from the other, without inspecting the sori; and a collector who allowed himself to be guided by the fancy that Athyrium ceases at the elevation where Polypodium alpestre begins, would be certain to collect a mixture; it was therefore important that the error should be corrected.

The following papers were read:—

Dyeing Properties of Lichens.

'Experiments on the Dyeing Properties of the Lichens;' by W. Lauder Lindsay, M.D., Assistant-Physician, Royal Crichton Institution, Dumfries.

The author presented to the Society the tabulated results of between 500 and 600 experiments made two or three years ago; the chief object of which was to endeavour to call attention to the fact, that we possess, in our own island, lichens capable of furnishing dyes nearly, if not quite, equal in beauty to orchil, cudbear, and litmus. He had so fully occupied the time of the Society on previous occasions with detailed views on this subject, and with various papers on general points in the natural history of the lichens, that on the present occasion he confined himself to a few facts explanatory of the tables:—

I. Certain genera and species of lichens, which are abundant in Scotland, and could be collected with comparative facility, and at a very moderate expense, might be tried with advantage on the large scale, as substitutes for the foreign lichens used in the manufacture of orchil, cudbear, and litmus. I have already indicated a favourable result in investigating native lichens on the small scale; but it remains for the manufacturer to test the permanence and utility of colours, which may merely look brilliant, without having any fixity.

II. This subject is worthy of being followed out by the manufacturer on the one hand, and the chemist on the other.

a. On account of scientific interest—the field being comparatively new and open, and at the same time most promising of good results.

b. Were it only with the view of further developing the economic resources of our own country.

c. Because the speculation [*i. e.*, the substitution of home for foreign dye-lichens], promises to be remunerative, as the Roccellas have frequently reached the high price of £1000 per ton in the London market.

III. The collection and transport of lichens, for the purpose of examining their colorific powers is very easy, viz.:—

a. By simple desiccation and packing.

b. By drying and pulverizing.

c. By precipitating the colorific principles from a lime-solution or a decoction by acetic or muriatic acids.

IV. The colour of the thallus and that obtained by the action of Stenhouse's or Helot's tests on solutions of the lichen-colorific principles do not always correspond in tint; more frequently the reverse obtains: hence, it is impossible from the colour or other external character of the thallus of a lichen to predicate the nature of the reaction of its alcoholic solution with chloride of lime, or the tint it will yield on ammoniacal maceration.

V. The lichens richest in colorific principles, capaple of yielding valuable colouring matters, are crustaceous and foliaceous species, of a pale or whitish colour — whose alcoholic or aqueous infusion is nearly devoid of colour, which grow on rocks or stones, and in mountainous countries, or on the sea-coast.

VI. The lichens most devoid of the same principles are species having a showy foliaceous thallus, attaining a considerable size, whose alcoholic and aqueous solutions are generally of the

same colour with the thallus, and which grow on trees and woods.

VII. The colours educible from lichens are liable to be materially affected, both as to quantity and quality according to a

a. Age of the specimen operated on, *i. e.*, length of period that has elapsed since collection and desiccation.

b. The geologic or other nature of its habitat.

c. The nature of its basis of support, whether moist or dry, rock, stone, tree, or earth, &c.

d. The amount of exposure to sunlight and atmospheric oxygen.

e. Amount of moisture in the air.

f. Temperature of the locality.

g. Elevation above the sea.

h. Season and vicissitudes of the weather.

i. Longitude and latitude in the two hemispheres.

k. Decomposition of organic bodies in vicinity.

VIII. Westring's triple division of lichens according to the fixity or permanence of the colours they yield with or without mordants, &c., and his quadruple division according as these colours are extractable by cold, luke-warm, hot or boiling water, aided or not by various accessions, are inconsistent and unnatural, and therefore not to be commended or followed.

IX. Westring's test of colorific power is inferior to Helot's or Stenhouse's; but all are fiequently fallacious, and are far from being applicable in all cases. It is probable that different alkalies and re-agents are suitable in different cases for the elimination of colouring matters.

X. The same circumstances, which modify the development of these colours on the small scale, cause material alteration in the results of manufacture. The result, however, is not always proportionate to the nature and amount of the modifying cause, insignificant circumstances frequently giving rise to most important and opposite changes.

XI. Speaking generally, the same process is equally applicable to the evolution of the red colouring matters of all lichens; but it is equally true that a slight modification of the process may cause a great variety in the degree or tint in any given species.

XII. The chief tint educible from lichens, which can be of any permanent utility in the arts, is red: brown is also useful in a minor degree.

XIII. Chloride of lime and aqua ammoniæ are only suitable for the

development of a red colour — or more strictly of colorific and colourless principles, capable of conversion into red colouring matters.

XIV. Chloride of lime is not uniformly to be relied on as a lichen-colorimeter for

Table XII. shows,

a. That the alcoholic solution of certain species may strike no blood-red colour with the re-agent, and still yield beautiful red and purple colours on ammoniacal maceration, and

b. Table XIII. shows that, though the alcoholic solution of some species do strike this colour [blood-red], it does not follow that ammoniacal maceration produces the same or a similar colour, or any colour at all.

XV. Simple maceration in a weak solution of ammonia, aided by a moderate heat and moisture, is the surest and simplest means of evolving the red colouring matters of the lichens.

XVI. Alcohol is an excellent solvent of the colorific principles of the plants, presenting them in a form readily acted on by chemical substances. Its use on the small scale is exceedingly convenient. The reaction of ammonia on a boiled alcoholic solution, allowed to stand for three days, is generally the same in tint, though not in degree, as on an aqueous solution exposed to the air for very long periods [one to twelve months]; but in some cases they differ essentially.

This difference is probably, in part, attributable to the small quantity of materials operated on, and the short period of maceration in the former case, and to the large quantity of materials, and the abundant exposure to atmospheric oxygen in the latter.

XVII. The non-evolution of colour in many cases may arise from

a. Alcohol or water not being the best or proper solvent menstruum of the colorific principles in any particular instance.

b. Ammoniacal maceration not being the proper means of converting the colorific into coloured substances.

c. The plant not containing colorific principles having the same chemical composition as orceire, &c., or showing similar reactions with chloride of lime and ammonia.

XVIII. If we accept, meanwhile, Stenhouse's and Helot's tests as sufficiently accurate indicators of colorific value, we should arrange the lichen-genera, which contain species yielding colouring matters, according to their value, as follows :—

Roccella, Lecanora, Umbilicaria, Gyrophora. Urceolaria, Parmelia,

Evernia, Borrera, Ramalina, Lecidea, Isidium, Sphærophoron; species of which yield fine *red* colouring matters: and Parmelia, Sticta, Cetraria, Nephromia, Solorina, Scyphophorus, Stereocaulon, Borrera, Lecidea, Peltidea, Colloma; some of which furnish good *brown* colours.

XIX. Among the general results of my experiments, it appears that, of 540 specimens examined,—

22 gave rich purple or red colours to ammonia alone (*i. e.*, by simple maceration).

8 gave brown colours to ditto.

93 alcoholic solutions gave rich purples or reds, on the addition of ammonia.

81 ditto, well-marked brown, ditto.

127 ditto, ditto orange, ditto.

42 ditto, ditto greenish yellow, ditto.

79 alcoholic solution struck a deep blood-red, with solution of chloride of lime.

XX. The whole subject of the intimate chemistry of the lichen colouring matters is in a very unsatisfactory condition, demanding reinvestigation, and Dr. Lindsay therefore repeated that the branch of the natural history of the lichens, to which, in this and previous papers, he had endeavoured to draw scientific attention, would form a worthy and remunerative object of research to the botanist, chemist, and wholesale manufacturer.

Potamogeton from Lough Corrib.

'On a species of Potamogeton from Lough Corrib, and other plants;' by J. Kirk, Esq., Coventry: communicated by Professor Balfour.

Mr. Kirk considered the Potamogeton as allied to P. longifolius of 'English Botany Supplement,' and remarked: — "My specimens differ from the plate in E. B. S. in having most of the leaves on long stalks, and in the absence of the apiculus. The specimen there figured was picked up floating in Lough Corrib, in July, 1835, by Mr. J. Ball, 'whilst sailing between Ma'am and Cong,' and given by him to Mr. Babington, and is the only specimen known to have been found in the British Islands up to September, 1853. The most striking character in my specimen is the singular and prominent midrib, the central portion of which consists of three longitudinal veins or ribs running closely parallel with each other, whilst on either side are three to six ribs running closely parallel to them, but rather more

distant from each other; the whole connected by transverse veins, and in the fresh state often more than one-fourth of an inch in width, the whole appearing, until closely inspected, a compact solid midrib, on either side of which are two to five fine veins, the whole connected by numerous secondary veinlets. Some of the submerged leaves were eighteen inches in length, and most beautifully pellucid, in this respect far surpassing the other British members of the genus. The floating leaves were scarcely coriaceous, linear-lanceolate or lanceolate, and occurred only in small quantities. The original specimen, in Mr. Babington's possession, exhibits traces of this peculiar midrib, which, I think, is almost sufficient to identify it with my specimen. The differences alluded to in the outset, are not more than may be found between specimens of well-known species gathered in their prime, and others gathered, as in the present specimens, where decay has actually commenced, witness P. rufescens and P. zosteræfolius. In the last-named species, the early leaves are invariably apiculate, but no trace of an apiculus is to be found in those produced during or after flowering time. Whether the plant is identical with P. longifolius, *Gay*, is a question I am not prepared to answer, but feel much disposed to doubt the latter being anything more than a name; at any rate no individual, with fresh specimens of my Lough Corrib plant before him, could overlook the prominent midrib, (although in the dried state it is not nearly so conspicuous). Mr. Babington, from inspection of some of my dried specimens, considers it different from his original specimen, on the grounds already stated, and is disposed to look upon it as, perhaps, Potamogeton sparganifolius, *Fries*. Mr. Borrer, to whom I sent recent fragments as well as dried specimens, considers it identical with the E. B. S. plant."

Mr. Moore, of Glasnevin, in transmitting similar specimens from Lough Corrib, named them P. longifolius.

Specimens of the Potamogeton were exhibited from Mr. Kirk, as well as some other rare plants, such as Rosa Sabini, *var.* Doniana, Potamogeton flabellatus, Naias flexilis, Rubus infestus, *W.* et *N.*, R. Balfourianus, *Blox.*, Symphytum tauricum, &c.

Mr. M'Nab communicated a register of the flowering of certain hardy plants in the Botanic Garden, as compared with the flowering of the same species during 1851 and 1853.

Also read, 'Illustrations on the application of Nature Printing to the copying of Botanical Specimens;' by W. Lauder Lindsay, M.D.

A List of the more interesting Plants found lately near Belfast, and their latest discovered additional Localities. By Mr. William Millen; revised, with additions, and communicated by W. M. Hind, Esq.

At a meeting of the Belfast Natural History Society in April last, a paper was read by Mr. William Millen, on 'Some of the more interesting Plants found near Belfast, with their latest Localities.' At the request of the Secretary, Mr. A. O. D. Taylor, Mr. Millen has furnished me with an abstract of his paper, which I have the pleasure of forwarding. I have underlined for italics such of the plants as were noticed in the 'Phytologist' for September, 1851; and have prefixed an asterisk to a few inserted on my own authority.

*Thalictrum minus, *L.* Sand-hills, Newcastle, Co. Down.
*Glaucium luteum, *Scop.* Sea-shore, Newcastle, Co. Down.
*Chelidonium majus, *L.* Derriaghy, Co. Antrim.
*Cochlearia danica, *L.* Ardglass, Co. Down.
*Cardamine impatiens, *L.* Shane's Castle, Co. Antrim.
*Barbarea vulgaris, *Br.* Derriaghy, Co. Antrim.
Sinapis tenuifolia, *Br.* Railway-terminus, York Street, Belfast.
*Reseda luteola, *L.* Lisburn.
*Viola flavicornis, *Sm.* Shane's Castle.
Drosera rotundifolia, *L.* King's Moss, &c.
*Polygala calcarea, *Schultz.* Cavehill, near Belfast.
Elatine Hydropiper, *L.* The Lagan, and Holywood Bog.
*Saponaria officinalis, *L.* Derriaghy, but most likely a garden outcast.
*Silene anglica, *L.* Newcastle.
„ *noctiflora*, L. Terminus, York Street.
Lychnis vespertina, *Sibth.* Derriaghy.
Radiola Millegrana, Sm. The Kinnegar, Holywood.
Erodium cicutarium, Sm. Terminus, York Street.
„ *moschatum*, Sm. Eden, Carrickfergus.
Geranium lucidum, *L.* Cavehill, following the débris of the chalk.
Euonymus europæus, *L.* Durpark, Cavehill, in the clefts of both trap and chalk.
Medicago falcata, L. Terminus at York Street.
*Vicia sylvatica, *L.* Cavehill, and Derriaghy.
„ bithynica, *L.* Terminus at York Street.
*Geum rivale, *L.* Cavehill, and Derriaghy.

*Comarum palustre, *L.* Derriaghy.

Rubus saxatilis, L. Colin Glen, Wolfhill Glen, Cavehill, and Woodburn.

Rosa hibernica, *Sm.* Tilly's Burn.

Epilobium angustifolium, *L.* Wolfhill Glen, Cavehill, and Woodburn.

„ roseum, *Schreb.* Glens in the Castlereagh Hill, Co. Down.

Hippuris vulgaris, *L.* Holywood Bog. (It has appeared occasionally on the Kinnegar, despite of unavoidable assaults). King's Moss, and bog-meadows.

Myriophyllum spicatum, *L.* In many pools and ditches.

Lythrum Salicaria, *L.* Lough Neagh, near Shane's Castle.

Peplis Portula, *L.* Kinnegar; Holywood Bog.

*Scleranthus annuus, *L.* Lurgan, Co. Armagh.

*Sedum Rhodiola, *DC.* Tor Point, Co. Antrim.

* „ Telephium, *L.* Derriaghy.

* „ anglicum, *Huds.*, and acre, *L.* Bangor, Co. Down.

*Sempervivum tectorum, *L.* Derriaghy.

Cotyledon Umbilicus, *L.* Woodburn, Knockagh, and Newtownards. (Also found on the Copeland Islands, *W. M. H.*)

Saxifraga tridactylites, *L.* On old walls, Lisburn.

„ hypnoides, *L.* Cavehill range.

Parnassia palustris, *L.* Island Magee. (Plentiful about Fairhead, and on the North coast of Co. Antrim.)

Adoxa moschatellina, *L.* Deer Park, Cavehill.

*Sanicula europæa, *L.* Cavehill; Derriaghy.

*Eryngium maritimum, *L.* Bellyholme Bay, Co. Down; and Red Bay, Co. Antrim.

Conium maculatum, *L.* Holywood; Carrickfergus.

*Smyrnium Olusatrum, *L.* Lisburn.

*Helosciadium nodiflorum, *Koch.* Cushendall.

Pimpinella saxifraga, *L.* Cavehill range of mountains.

Œnanthe pimpinelloides, *L.* Bunker's Hill; Kinnegar.

* „ Lachenalii, *Gmel.* Bangor.

* „ Phellandrium, *Lam.* The Lagan.

Sambucus Ebulus, *L.* Holywood; Bangor.

*Sherardia arvensis, *L.* Derriaghy.

*Crepis paludosa, *Mœnch.* Cavehill.

*Bidens tripartita, *L.* Lurgan.

*Eupatorium cannabinum, *L.* Ardglass, &c.

Artemisia campestris, L. Terminus, York Street.

*Gnaphalium dioicum, *L.* Cavehill.

*Erigeron acris, *L.* Cavehill.

*Doronicum pardalianches, *L.* Ballymaeash, growing in quantity, but evidently outcast from an adjoining garden.

*Pulicaria dysenterica, *Gært.* Near Larne, &c.

Campanula rotundifolia, *L.* Cavehill range of mountains (and pretty generally diffused through the northern parts of Co. Antrim. This plant I have gathered with white flowers, and of a very compact habit of growth.—*W. M. M.*)

Jasione montana, *L.* Cavehill, Knockagh, &c.

*Erica cinerea, *L.* (*floris albis*). Slieve Donard.

Pyrola rotundifolia, *L.* Wolf hill; Colin Glen; Scrabo.

*Vinca minor, *L.* Derriaghy. In profusion about the remains of the residence of the celebrated Jeremy Taylor, Lord Bishop of Down and Connor; and Dromore.

*Villarsia nymphæoides, *Vent.* The Lagan.

Convolvulus arvensis, *L.* Larne.

* „ Soldanella, *L.* Newcastle; Cushendun.

*Atropa Belladonna, *L.* I venture to introduce this plant on the authority of Miss Hincks, of Derrykirghan. Locality, Benwarden.

*Veronica scutellata, *L.* Derriaghy.

„ Buxbaumii, *Ten.* Camber Railway-station, abundant; Murray's Terrace gardens; Cavehill; Tilly's Burn.

*Linaria Cymbalaria, *Mill.* Old walls, Lambeg.

Orobanche rubra, *Sm.* Cavehill range.

Lathræa squamaria, *L.* Colin Glen; Springfield; Cavehill.

*Thymus Serpyllum, *L.* (var. *floris albis;* the foliage clothed with a dense whitish down). Knockagh. This plant retains its character under cultivation, and, as it is a good flowerer, answers well for small geometric beds.

*Lamium amplexicaule, *L.* Newcastle.

* „ incisum, *Willd.* Newcastle.

Prunella vulgaris, *L.* A white and small variety, found in the Deer Park, Cavehill. A specimen has been removed to the Royal Botanic Gardens.

Lithospermum officinale, *L.* Deer Park, and Derriaghy.

„ arvense, *L.* Whitehouse.

*Mertensia maritima, *Don.* Newcastle on the sea-shore.

Symphytum officinale, L. Cavehill.

„ *tuberosum*, L. Carnmoney Hill, above the church.

Lycopsis arvensis, *L.* Sea-shore below Cultra.

Anchusa sempervirens, *L.* Terminus, York Street; Lisburn.

*Pinguicula lusitanica, *L.* Slieve Donard, and northern parts of Co. Antrim.

Utricularia vulgaris, *L.* King's Moss.

„ minor, *L.* Holywood Bog.

Lysimachia Nummularia, L. Banks of the Whitehouse stream, at Maryville.

*Anagallis tenella, *L.* Bangor, Ardglass, Fairhead, &c.

Samolus Valerandi, *L.* Sea-shore at Bunker's Hill; Cultra; (Ballyholme; Ardglass).

Statice spatulata, *Desf.* (binervosa, *G. E. Sm.*) Sea-shore, Bunker's Hill; Comber.

Littorella lacustris, L. Kinnegar; (Shane's Castle, Lough Neagh).

*Atriplex littoralis, *L.* Sea-shore, Newcastle.

*Beta maritima, *L.* Sea-shore, Newcastle. I find a marked difference in the leaves of two specimens of this plant gathered by myself, in the summer of 1845. In one the leaves are nearly rhomboidal; and in the other, hastato-cordate.

*Salsola Kali, *L.* Ballyholme Bay.

*Salix pentandra, *L.* Common, Stonyford and Derriaghy.

I possess specimens of two willows gathered at Shane's Castle, and both seemingly belonging to the group "nigricantes." I have marked them doubtfully as S. nigricans, *Fries*, S. Forsteriana, *Sm.*

*Myrica Gale, *L.* Slieve Donard; Shane's Castle.

Neottia Nidus-avis, *Rich.* Colin Glen; (Massareene Park, Antrim).

*Listera ovata, *Br.* Bangor; Derriaghy.

Epipactis latifolia, *Sw.* Some distance around Belfast.

*Orchis latifolia, *L.* Shane's Castle Park.

*Gymnadenia conopsea, *Br.* Conlig, Co. Down.

Habenaria bifolia, *Br.* Straid; Derriaghy.

* „ chlorantha, *Bab.* Cavehill.

„ viridis, *Br.* Little Knockagh; Black Mountain.

„ albida, *Br.* Cavehill.

*Allium ursinum, *L.* Cavehill.

Scilla verna, *Huds.* Bangor, (Ballyholme Bay, &c.)

Anacharis Alsinastrum, *Bab.* Waringstown, Co. Armagh.

Alisma ranunculoides, *L.* Holywood Bog, &c.

*Potamogeton pectinatus, *L.* The Lagan.

* „ pusillus, *L.* The Lagan.

*Potamogeton gramineus, *L.* The Lagan.
Ruppia rostellata, *Koch.* In saltwater drains near the railroads on both sides of Belfast Bay.
Narthecium ossifragum, *Huds.* Holywood Bog, &c.
*Schœnus nigricans, *L.* Bangor; Newcastle.
*Scirpus Savii, *S. & M.?* Bangor.
* „ maritimus, *L.* Stranmillis, Belfast.
* „ sylvaticus, *L.* Derriaghy.
*Ammophila arundinacea, *Host.* Newcastle.
*Molinia cærulea, *Mœnch.* Newcastle.
*Triticum littorale, *Host.* Newcastle.
* „ junceum, *L.* Newcastle.
*Polypodium Phegopteris, *L.* Slieve Donard.
Hymenophyllum Wilsoni, *Hook.* Cavehill.
Botrychium Lunaria, Sw. Cavehill range.
*Lycopodium clavatum, *L.*, and Selago, *L.* Divis, &c.
* „ selaginoides, *L.* Slieve Donard.
Equisetum umbrosum, *Willd.* Wolfhill Glen; Woodburn.
„ hyemale, *L.* Banks of the Forth river, at Springfield.
„ Mackaii, *Newm.* Colin Glen.
* „ variegatum, *Schl.* Divis.

The more common plants have been omitted, and a few of those mentioned in a former list. I doubt not that further search will not go unrewarded, by the discovery of many plants of interest to the botanist.

W. M. Hind.

Stapenhill Vicarage,
June 2, 1854.

Notes on some rare Plants, including Ajuga pyramidalis, in Arran.
By David Moore, Esq., F.L.S.

Being in the West of Ireland last month, when the weather was fine, my friend Professor Melville, of the Queen's College, Galway, and I, made a hasty excursion to the Islands of Arran, where we collected most of the interesting plants which grow thereon, in good condition.

From what I then saw, I consider May the best month for botanizing on those islands. The principal plants are early-flowering

species; and the warm limestone débris on which they grow accelerates their blooming.

The rocks and gravelly pastures were then quite yellow with the pretty flowers of Helianthemum canum; and the lovely Gentiana verna must have beeu gay about the end of April, when in full bloom: a few of the brilliant blue flowers were still to be seen, but most of them were in seed. Astragalus hypoglottis and the pretty rock-plant occurred in considerable quantities in several places, accompanied by its fair rival, Arenaria verna, which was in profuse bloom. Arabis ciliata was also in full bloom, and Asperula cynanchica showing blossom.

Allium Babingtoni, which grows abundantly in many parts of the island, had already reached a height of more than three feet, though not nearly full grown; and the gem of Arran plants, namely, Adiantum Capillus-Veneris, had ventured to protrude its delicate young fronds out of the warm limestone fissures, where it grows so abundantly.

The foregoing shows that a fair share of our prettiest indigenous plants are congregated together on Arran, which affords the only Irish habitat for two of them, *viz.*, Helianthemum canum and Astragalus hypoglottis. To these we were fortunate enough to add a third, namely, Ajuga pyramidalis. Only two plants of it were observed; but no doubt there are more on the island; and I further consider it reasonable to suppose that it will yet be found on the opposite mainland of Connemara, where Eriocaulon septangulare, Arabis ciliata, Palmella montana, and other plants occur which grow in the North-west of Scotland, in nearly the same geographical range with Ajuga pyramidalis.

We visited the small island called Stran Island, where, in 1805, Dr. Mackay found Matthiola sinuata, which is not now growing there. It is, therefore, probable that plant is lost to the Irish Flora.

From the position of Arran we expected to find some scarce Cryptogamic plants, but were disappointed. There are very few species of lichens, mosses, or Jungermanniæ, and none that we observed rare. It was rather curious to see some of the species, which seldom grow except on trees, adapting themselves to circumstances, and covering the faces of rocks, in the total absence of arboreal vegetation. This was especially the case with Hypnum trichomanoides, H. complanatum, and Jungermannia complanata.

Our time (only two days) did not admit of a close examination of the marine Algæ, which grow in great abundance, and form the prin-

cipal harvest of the Islanders, who collect them in large quantities for sale to the farmers on the mainland, who use them extensively as manure. Fine examples of some of the more showy species of the Floridæ section were observed, affording sufficient indication that some of the rarer kinds might be found if properly sought for.

D. Moore.

Glasnevin, June 5, 1854.

Contributions to British Lichenology.

By John G. Baker, Esq.

During part of the past winter I have been occupied arranging my collection of lichens, and examining the accumulated stores of the Yorkshire Philosophical Society; and have also been favoured with the loan of an extensive series of specimens, belonging to my friend I. Brown, of Ackworth. Through the medium of the 'Phytologist' I propose to describe a few species, or forms, which have either not been known before as inhabitants of Britain, or have been in some way involved in confusion or misunderstood.

1. *Evernia vulpina* (L. vulpinus, *L.*) — Thallus pale yellow, much branched in a divaricate manner, irregularly angular and lacinose. "Apothecia sessile, disk brownish."

Lichen vulpinus,* *L. Sp.* 1623; *Suec.* N. 1129; *Fl. Dan.* t. 226; *Ach. Prod.* p. 179. Parmelia, *Ach. Meth.* p. 267; *Schær. Spic.* 489. Usnea, *Hoffm.* Evernia, *Ach. Lich. Univ.* p. 443; *Fries, Lich. Eur.* p. 23; *Summa Veg. Scand.* i. p. 103. Cornicularia, *DeC. Fr.* ii. p. 329; *Schær. Enum.* p. 6. L. auratus, *Vill.* L. citrinus, *Schrank.*

Exsic. Fries, Lich. Suec. 142; Fl. Deutsch. 70; Schær. Lich. Helv. 390.

On trunks of trees, Killiney Hills, Co. Dublin, 1842, *R. Jacobs in herb. J. Brown.* Several examples are also included amongst an extensive series of English specimens, collected by the Rev. J. Harriman, preserved in the Daltonian herbarium, which are not labelled with their special stations. This beautiful and conspicuous lichen has been well known upon the Continent from the days of Haller and Linnæus downwards. In the 'Enumeratio,' Schærer marks it as

* Some of these references are taken on the authority of the 'Lichenographia Europea' and the 'Enumeratio,' as I have not had an opportunity of consulting all the works and fasciculi mentioned.

growing "on logs of wood and the trunks of coniferous trees, especially larches, in elevated situations, from Italy to Sweden, and from the Pyrenees to Tyrol." Our British species of the genus Evernia, as defined by Fries, range themselves under two groups. The first of these, to which the plant under notice belongs, is characterized by a fruticulose thallus, and is made up of species placed under Alectoria and Cornicularia by Acharius. It is also represented in our Flora by two widely distributed and variable species, E. jubata and E. ochroleuca, from both of which E. vulpina differs greatly in habit and appearance, and may be readily distinguished by the characters given above. In fact, it seems more analogous to E. flavicans (Borrera, *Ach.*), which may be regarded as a sort of connecting link between the fruticulose and foliaceous groups than to either of them; but even to this species it bears only a distant resemblance. There appear to be two principal forms of variation: the first with an elongated filamentose thallus, light yellow in colour and nearly smooth; the other with a shrubby and somewhat stunted thallus, covered with granular, yellowish or sublivid, distinct or aggregated soredia. The specimens which I have seen from Sweden (coll. Swartz) and Switzerland (Schærer) belong to the latter variety (the original plant of Linnæus), which is much more widely distributed than the other, but is never found in a fertile state. The Irish and English specimens belong to the filamentose form, but they are also barren. Indeed, Schærer states the apothecia are only found very rarely. I have also had a Worcestershire locality reported, which Mr. Lees has kindly undertaken to investigate.

2. *Evernia divaricata* (L. divaricatus, *L.*)— "Thallus glaucous, glabrous, lacunose, rough, concolorous; segments involute, filiform, pendulous, branched in a divaricate manner, afterwards cracking round. Apothecia lateral; disk brownish; border thin, entire."— *Schær. Enum.* p. 12.

Lichen divaricatus, *Linn. Syst. Nat.* 713; *Ach. Prod.* p. 226. Parmelia, *Ach. Meth.* p. 269. Evernia, *Ach. Lich. Univ.* p. 441; *Fries, Lich. Eur.* p. 25; *Summa Veg. Scand.* i. p. 103. Physcia, *Schær. Enum.* p. 12. Parmelia mollis, γ. divaricata, *Schær. Spic.* 491. Usnea flaccida, *Hoffm.* pl. lich. t. 67, figs. 1, 2; *DeC.*

Exsic. Moug. and Nest. 545; Fries, Lich. Suec. 332; Schær. Lich. Helv. 392.

Like the preceding, this species is included amongst a series of English specimens, without special localities, collected by the Rev. J. Harriman, in the Daltonian herbarium. Like the preceding, also, it

has been well known for a long time, having been figured by Dillenius and characterised by Linnæus. According to Schærer, "it hangs, frequently in great profusion, from the branches of pine-trees in mountainous and alpine woods throughout all Europe." So that it might be expected, with considerable probability, to occur in this country. It belongs to the section of the genus distinguished by a more or less compressed foliaceous thallus, of which the clearly established British representatives are E. prunastri, E. furfuracea, E. intricata, and E. flavicans. Of these it is most nearly allied to the first-mentioned; but may, however, be very readily known by the pendulous, filiform segments of its thallus, and by its differently shaped and coloured apothecia and intricate habit of growth. By age the outer membrane of the thallus is ruptured at intervals, and the medullary cord exposed, exactly as in the analogous articulate state of Usnea barbata (vide Eng. Bot. t. 258, fig. 1).

3. *Cetraria cucullata* (L. cucullatus, *Bell.*)—"Thallus cartilaginous, subfoliaceous, sinuato-lacinate, pale yellowish; margins connivent, undulated. Apothecia adnate to the back of the lobes; disk pale reddish."—*Fries, Lich. Eur.* p. 37.

Lichen cucullatus, *Bell. Osserv. Bot.* 154; *Smith, Trans. Linn. Soc.* i. t. 4, fig. 7; *Ach. Prod.* p. 171. Cetraria, *Ach. Meth.* p. 293; *Lich. Univ.* p. 511; *Fries, Lich. Eur.* p. 37; *Summa*, i. p. 103; *Schær. Spic.* ix. 248; *Enum.* p. 14. Platisma, *Hoffm.* pl. Lich. Lobaria, *Hoffm. Germ.* Physcia, *DeC.*

Exsic. Fries, Lich. Suec. 173; Schær. Helv. 18; Moug. and Nestl. 544.

Examples of this species are placed amongst a series of specimens of C. nivalis, from the "Cairngorm mountains, Scotch Highlands," in the Daltonian herbarium.

This lichen belongs to the class of species which, like several flowering plants, have their head-quarters in Arctic Europe, and are also generally distributed throughout the Continent in alpine and elevated situations, but do not in the South descend into the low grounds. With reference to the Continent, Schærer marks C. nivalis as its "very faithful associate;" but in Britain the relative frequency of the two species appears to be reversed, and it is C. cucullata that is the casual companion of C. nivalis. Besides resembling each other in their geographical distribution, they are also closely allied in habit and appearance. Sir J. E. Smith says, respecting C. cucullata, that it is "apparently intermediate between nivalis and islandica;" but it is

the former to which it bears the greater resemblance, both in colour and characters. In a fertile state it may be most readily known by its curious nephroma-like apothecia. It is also considerably less crisped and laciniated than C. nivalis, and the base is purplish instead of golden yellow.

John G. Baker.

Market Place, Thirsk,
June 10, 1854.

Notice of the Occurrence of Arum Italicum at Steephill, Isle of Wight. By Albert Hambrough, Esq., F.B.S. of Edinburgh London.*

Some three or four years ago, when wandering, in company of my much-lamented friend, the late Dr. Bromfield, amongst the broken rocky ground in the Undercliff of the Isle of Wight, I recollect our attention being attracted by the unusually large size of the leaves of an Arum, and also by the peculiar divarication, or divergence, of the lobes of its sagittate leaf. This was in either April or May, and the plant showed no sign of flower. Dr. Bromfield at the time was much struck by its appearance, and requested me to watch it, as he suspected it might prove to be Arum Italicum. It has, however, so happened that until the present year I have not been in that part of the island at the time the plant produces its flower; and, indeed, the circumstances above mentioned had altogether escaped my memory, until it was recalled to my recollection, in June last, by the appearance of an Arum, in flower, near the spot where it was first observed by Dr. Bromfield. The bright yellow colour of the spadix, so different from the dull purple of the same part in Arum maculatum, at once led me to examine it closely; and upon comparing it with the description of Arum Italicum given by Koch, in his 'Synopsis Floræ Germanicæ et Helveticæ,' I found it exactly to correspond, with the exception of the time of flowering, which, according to Koch, should be in April; whereas my plant produces its flowers in June; but the warm springs of South Germany and Italy will sufficiently account for the greater forwardness of the Arum in the above-mentioned countries, of which I believe it is a native. Fearing that the plant might be a mere settler, accidently introduced, my next step was to examine

* Read before the Isle-of-Wight Philosophical and Scientific Society, Feb., 1854.

the surrounding coppices and rocks for more specimens; and to my surprise I found the yellow-spadix Arum to be the prevalent representative of the family, and abundant everywhere; whereas I had some difficulty in finding specimens of Arum maculatum, and those I did find were all in fruit, with one or two exceptions. It was not until the latter end of August that I had an opportunity of examining ripe fruit of the other plant, as none matured itself before that time. The description by Koch of Arum Italicum is as follows:—

"Arum Italicum. — Foliis hastato-sagittatis albo-venosis. Spadice recto. Spatha breviori clavato, clavâ stipitem suum æquante.— In vineis et sylvaticis. Regionibus calidis—April—Spadix Flavus."

With this description, so far as it goes, my plant accords; and from examination of the fruit and buds I am enabled to add, that the fruit of the Isle-of-Wight Arum Italicum is twice the size of that of A. maculatum, and produced in much more elongated spikes. The buds also are double the size, and fewer in the berry than in A. maculatum, seldom exceeding three in each berry; in A. maculatum there are frequently six and eight. The average height of the fruit-stalks in my plant is two feet, and they are sheathed by the foot-stalks of the leaves to the height of four or five inches from their base; the leaves remain green contemporaneously with the fruit, but eventually disappear, though only for a short time, as the Arum is now (November) again in full leaf.

The plant I have thus ventured to describe is abundant in the coppices and amongst rocks and ivy at Steephill Castle and the neighbourhood. It appears to me to be certainly distinct from Arum maculatum; and I only hope that an examination next year, by more competent botanists than myself, may establish its title to the name of Arum Italicum.*

* Specimens of the plant were exhibited by the author to the members of the Philosophical and Scientific Society at the reading of the paper, and compared with specimens of Arum Italicum from the garden of St. John's, near Ryde, kindly brought for that purpose by Mr. Lawrence, who, many years since, received the plant from Mr. Borrer. The slight difference between the plants thus compared appeared to the Members present to be only such as the different circumstances of their growth would fully account for. For future comparison wild plants from Steephill have been planted in St. John's garden; while offsets from Mr. Borrer's stock have been consigned to the rocky banks of Steephill, under the eye of the author of the above paper.— *Benj. Barrow; Hon. Sec. Phil. and Scient. Soc. of I. W.*

A List of the Ferns and their Allies found in the County Dublin, with special reference to the Dodder Valley. By John Robert Kinahan, M.B., Hon. Sec. Dublin Nat. Hist. Society.

The following Catalogue does not pretend to be a correct list of all the ferns found in the County Dublin, being merely a record of such as have fallen under my own observation in my rambles, during the last five or six years, in those parts of the county which lie to he South-west of the Liffey. This river in its easterly course to the sea divides the county pretty fairly in two. Of the district to the South of it, it may be advisable to say a few words. From the river the country stretches out South with but few breaks till it reaches the Dodder; it then gradually rises, more or less abruptly, till, at the extreme boundary close to the head of that river, it attains the height, in the ridge of Keppine, of 25 to 27 feet above the sea-level, being, in fact, part of the mountain chain to whose picturesque wildness Wicklow owes so much of its fashionable scenery. These hills vary much, though they are for the most part one immense bog, barren of everything except heath and Lycopodiums, and such-like plants; in some of the higher peaks not even these will grow, and you have nothing but peat, bare of every kind of vegetation. They are, however, intersected by stream-glens of surpassing loveliness and richness in botanical treasures. All these, with six or seven exceptions, run into the valley of the Dodder, whose stream they swell with their waters. This river, rising close to the butt of Kippine, after flowing through an open bog for about a mile, plunges into a romantic clay-slate range, from which it emerges at Castlekelly, a little below which it is joined by the Middleton Brook, which is made up of the Lot Brook and Slade Brook, the first rising from Glas-a-vullawn, and the second from part of the Feather-bed range. These streams conjoined flow on in a very tortuous manner through Kelly's Glen, between the steep clay bluffs, on which is situated the pretty little holy well and graveyard of Kilnasantan, till, having passed through Glenismaul or Thrush Valley, beneath and between the breaks of Ballina's Corney, it finally, just below Bohemabreena, at Kiltippet, emerges into a comparatively level country, through which it winds for about eight miles to the sea. Just as it reaches Bohemabreena it receives a tributary rivulet from Shane's Glen, remarkable as being the only white water, *i. e.*, stream not boggy, which it receives. This rises at the back of Montpelier, and flows chiefly through a gravel district, just before its termination

rushing through a narrow clay-slate gorge well stored with Asplenium Trichomanes, Dryopteris affinis, and Phyllitis Scolopendrium. During this entire valley the botanist will find himself in a paradise, especially of ferns, as in or about it are found more than two-thirds of the species recorded as Irish; not to speak of other rarities, such as Listera cordata, Habenaria viridis, H. albida, and other plants rare in the West of Ireland. Of the Musci and Fungi I will not speak; but if any cryptogamist wishes a treat, let him search these glens, and he will not repent his labour.

Lastrea montana, Newm. Local. Abundant in the glen near Middleton Brook, where I first met it in June, 1854. Glenismaul, more sparingly.

Lophodium Fœnisecii, Newm. Very rare. A few weak plants in the Lot-Brook Glen, at the foot of a cascade; also in a glen in the Feather-bed, very weak and straggling. Hill of Howth, North side, very rare. I cannot account for the rarity of this fern, so abundant in the neighbouring countries, and so general throughout Ireland.

„ *multiflorum*, Newm. Very common, especially on the exposed mountain-sides and in the shady glens. All the plants have spines on the portion of the stipes next the ground.

Variety "*nanum*." Very common. Not always growing in the most exposed situations. Kelly's Glen.

N.B. Further study of this group will doubtless discover other of the named forms. These are all I can be certain about.

Dryopteris affinis, Newm. Very common, frequenting low grounds. Very distinct; earlier in vernation and more robust than the next, often growing more than five feet high. Friarstown and Dodder Valley.

„ *Borreri*, Newm. Very common, frequenting for the most part the higher grounds. About a month later than the last in its vernation. Easily distinguished from that species by its golden yellow colour. Dodder Valley.

Athyrium Filix-fœmina, Roth. Very common. The following varieties are found. I cannot convince myself of their distinctness; or, rather, I know several other forms as distinct and not intermediate, particularly the two glandulose ones recorded below.

„ var. *convexum* (?). What I take to be this form is common on the hills, varying much in its size and cutting. A most beautiful form, with red stipes, covered over with glands, is found in Kelly's Glen. It appears distinct.

Athyrium Filix-fœmina, var. *incisum*. Very common and fine. A form of this is also found in Kelly's Glen, with *glandulose* green stipes; also a crisped, curled subform, analogous to that of Polystichum angulare.

„ „ var. *molle*. Rare. Kelly's Glen. A frond so named by Mr. Newman was gathered by me there. In Killakee woods, rather abundant.

Asplenium Adiantum-nigrum, Linn. Local. On walls. On a clay-bank at Friarstown, near Bohemabreena.

„ *marinum*, Linn. Rare. Used to be abundant at Killiney, but the station is nearly destroyed by railway cutting. Howth, North side. I have found it also on Killiney Abbey.

„ *Trichomanes*, Linn. Rare and local. On conglomerate rocks at Tilsadin; sparingly on rocks overhanging Glenismaul; in Shane's Glen, on walls, very abundant and fine; Miltown Bridge.

Amesium Ruta-muraria, Newm. Local, but not rare. Friarstown.

Phyllitis Scolopendrium, Newm. Common in suitable localities, Kelly's Glen.

Notolepeum Ceterach, Newm. Very local and rare. Whitechurch, a very few plants, on walls; Belgard, do. do.; (Laram, on North side of Liffey, more abundant, *W. H. Luscombe, Esq.*)

Botrychium Lunaria, Swartz. Local. Kilnasantan and bluffs along Kelly's Glen, in patches. A fine subform, with deeply incised fronds, found here, growing in patches, distinct from the ordinary form. Plants from six to nine inches high, growing with the next, April, 1854. This fern was found previously in this neighbourhood, by Dr. J. Mackay, higher up the glen.

Ophioglossum vulgatum, Linn. All along the bluffs of the Dodder Valley, very abundant; at Kilnasantan, with the last, April, 1854.

This includes all the species of true ferns I have myself met with. The following are recorded by Mackay as occurring; but I have not been fortunate enough to meet with them.

Hymenophyllum Wilsoni. Kelly's Glen; also found there by W. Andrews, Esq.

„ *Tunbridgense*. Same place, but doubtless an error of nomenclature, the two species having been formerly confounded by observers. Thus both are recorded at Powerscourt Waterfall: I have searched carefully, and could only find H. Wilsoni. Nor do I know of any authentic specimen of H. Tunbridgense

from this locality: those shown me as such are all H. Wilsoni, which I find in its distribution in Ireland is the more northern fern of the two, H. Tunbridgense replacing it in the South. All our critical practical botanists with whom I have conversed on this subject hold the same opinion.

Osmunda regalis, Linn. Formerly found in Kelly's Glen. The station is now drained, which perhaps accounts for its not being found there now.

The fern-allies I have not studied so well; therefore my list is more meagre. Isoetes lacustris and Pilularia globulifera are wanting, owing to the absence of suitable localities for them. The Lycopodiums are well represented, the only species wanting being L. alpinum, an alpine species, and L. inundatum, found, I believe, in the Co. Galway, but I have never seen Irish specimens. In the Equisetums the following are wanting: — E. Mackaii, a northern species; E. umbrosum, also a northern species, though I believe I have met with it in Dublin; and E. Moorei, a new species, lately discovered in Wicklow, and described by Mr. Newman.

Equisetum arvense, Linn. Too common; a troublesome weed. Kelly's Glen.

„ *hyemale*, Linn. Rather rare. Near Whitechurch.

„ *limosum*, Linn. Local. Common in swamps along Grand Canal.

„ *palustre*, Linn. Common. Firhouse; Kelly's Glen. The following varieties all occur:—nudum, rare; alpinum (?); polystachion, very rare, Kelly's Glen.

„ *variegatum*, Weber & Mohr. (Portmarknock Strand, North side. I have been shown fresh specimens).

„ *sylvaticum*, Linn. Very fine and abundant. Kelly's Glen, and Three-rock Mountains.

„ *Telmateia*, Ehrh. Very fine and abundant. Kelly's Glen, and the entire valley of the Dodder.

Lycopodium selaginoides, Linn. Rare. (Howth, North side. Plants shown me).

„ *clavatum*, Linn. Rare. Cruagh Mountains, Featherbed, and Kelly's Glen.

„ *Selago*, Linn. Common on high bogs. Middleton Brook and Kelly's Glen, and over mountains generally.

All these species have been found growing by myself, except those in parentheses; and of these I have seen original plants.

I have purposely omitted from this list all monstrous forms (with one exception, mentioned for the purpose of clearing up its history); for these I conceive out of place when treating merely of species, their only importance being in the study of Morphology.

Of the species (recorded as Irish) which are absent from this list, Adiantum Capillus-Veneris, Asplenium acutum, Trichomanes radicans, Hymenophyllum Tunbridgense, Gymnocarpium Dryopteris, Allosorus crispus, and perhaps I should add Cystopteris fragilis, are absent, owing to geographical causes; the first four being here southern and western species, as far as I can learn. Hymenophyllum Tunbridgense has been recorded in the Co. Wicklow, but on insufficient authority. Gymnocarpium Dryopteris is a rare northern species in Ireland, as also is Allosorus crispus, though I believe it formerly existed in the Co. Dublin, as Wade, in his 'Planta Rariores Hiberniæ,' published in 1804, records it, under the name of Pteris crispa, as "occurring on very old walls about Rathfarnham, and on an old rock or stone as you go into Dalkey." Both these localities are now destroyed; but he is generally very accurate, and the parsley-fern is a species that could hardly be mistaken for anything else; so accurate is he, that merely with his book I have now, after the lapse of fifty years, found little difficulty in finding many of his stations for plants. Cystopteris fragilis the same author records as occurring near Tamlaght Hill. I have not succeeded in finding it there, though perhaps it exists. The district is clay-slate: I have always, in the West, found this fern on limestone. He may, perhaps, have mistaken some form of Athyrium Filix-fœmina for it, as I have known several persons to fall into the same error. The want of suitable high mountains doubtless deprives this county of Asplenium viride, though I think it probable a search among the mountain glens behind Tamlaght Hill might discover this fern. Polystichum Lonchitis, another dweller in high mountains, is doubtless absent from the same cause; most of our mountain-ridges being entirely capped with bog, on which, in many places, even the heather refuses to grow. Hemestheum Thelypteris is absent, from want of a suitable locality, our bogs being too much exposed. Lophodium rigidum and L. spinosum have as yet been recorded only in one county each. L. Callipteris has not yet been found *wild* in Ireland. Gymnocarpium Phegopteris is one of the very rarest of Irish ferns. I cannot account

for the scarcity of Lophodium Fœnisecii; in every other part of Ireland I have been it is abundant, but is entirely absent here from localities suited well, one would think, for it. The same remark may also apply to Polystichum aculeatum, which in the neighbouring county of Kildare is most abundant, as at Tullow. Notolepeum Ceterach is a more southern fern, and also a frequenter of limestone or clay-slate; whilst most of the district from which these remarks are compiled is granite or quartz-rock. The Lycopodiums and Equisetums call for no remark, further than those in the commencement of this list.

J. R. Kinahan.

Donnybrook, near Dublin,
June, 1854.

Notices of New Books.

'*The Botany of the Voyage of H.M.S. Herald.*' By Berthold Seemann, Ph. D., M.A., F.L.S., Memb. Imp. L. C. Acad. Royal 4to. Parts III. and IV., each containing 40 pages of letterpress and 10 Plates. Price 10*s.* each. London: Reeve. 1854.

This valuable work is continued with the same spirit, skill and learning with which it was commenced. It consists chiefly of a carefully compiled list of the species found during the voyage; and the portion now in course of publication will form a very complete Flora of the Isthmus of Panama. The new genera and species are described with great minuteness; and here and there occur critical observations, that evince at the same time great knowledge and sound judgment. Such, for instance, is the following, on the Turneraceæ and Passifloraceæ:—

"All botanists consider Turneraceæ and Passifloraceæ as allied to each other, but few seem to be aware that these orders are so closely related as they really are, that the differences between them are merely imaginary, that in fact they constitute one and the same family of plants. I was led to this conclusion by the discovery of the American genus Erblichia, *Seem.*, figured in Plate XXVII., and by the subsequent examination of several Turneraceæ. All Turneraceæ are described in systematic works as 'herbaceous plants, having sometimes a tendency to become shrubby.' This description however applies to only a few Turneras; T. Salicifolia, *St. Hil.* (T. Hindsiana,

Benth.! Corchorus grandiflorus, *Spring.!*), is a real shrub, from 6 to 8 feet high; and Erblichia odorata, *Seem.*, is a good-sized tree, often attaining a height of 30 feet and more. The leaves are said to be exstipulate,—another misstatement, as all Turneraceæ have stipules. In Turnera ulmifolia, *Linn*,—a common hot-house plant, from which most authors seem to have solely derived their knowledge of this group,—they are, on account of the hairy covering of the stem, hardly visible, but in the more glabrous species, such as T. Salicifolia, *St. Hil.*, they are plainly to be seen, and in Erblichia odorata, *Seem.*, they are still more manifest. The calyx is, in Turnera and Piriqueta, monophyllous; in Erblichia, pentaphyllous. The latter is doubtless the normal state of the calyx of the order, for if the calyx of the two former is examined, it will be found that its lobes are in fact true sepals, traceable to the very base. The connecting link between them appears to be Erblichia, one of those peculiar genera, the discovery of which will always produce great changes. As no other points of difference besides those already disposed of seem to exist between the orders, I have no hesitation in uniting Turneraceæ and Passifloreæ into one Natural Family, adopting the name of Passifloraceæ for both."

The following passage is also extremely interesting, not only on account of the information it contains, but also as affording a very obvious and satisfactory explanation of a statement made by Mr. Griffiths, who believed he had discovered a non-parasitic Loranthus. While it would be most rash to assert that all the species of a genus were either parasites or the reverse, still the very evident and very prevailing parasitism of the species of Loranthus and Viscum fairly induces the conclusion that this *is the case*, and leads one to inquire with more rigid scrutiny into all statements having an adverse bearing. In the present instance we have no doubt that a very careful and accurate botanist was deceived by appearances.

"The three last-named species [of Loranthus] have scarlet flowers, more or less tipped with yellow, rendering them very ornamental; indeed there can hardly be finer plants than many species of Loranthus inhabiting tropical and subtropical countries, yet we never find them in any of our European gardens. Imagine a dense grove of misseltoes bearing, instead of the insignificant green flowers of our common Viscum album, *Linn.*, blossoms of the brightest scarlet or yellow, and often averaging more than eight inches in length! Such are the species of Loranthus alluded to, which, to render them still more worthy of the attention of the horticulturist, do not in most cases

grow on the top of high trees, where their beauty would be almost concealed to the naked eye, and their charms in a great measure lost, but upon low shrubs, and often so near the ground, that several botanists have been induced to consider them terrestrial plants. But about their parasitism there can be no doubt. Griffith once thought that he found a terrestrial Loranthus (referred to in his Itiner. Notes, p. 63, No. 961); and writing at Myrung, he says: 'The vegetation of the hills about here is much the same as about Moflong. . . The most curious tree is one which, with the true appearance of an Elæagnus, seems to be a Loranthus, the first arborescent species yet found, although, as one or two other exceptions occur to parasitism, there is no reason why there should not be a terrestrial arborescent species, as well as a fruticose one.' However, when Dr. J. D. Hooker and Dr. T. Thomson visited the neighbourhood of Myrung, in the Khasia mountains, the locality where that author met with the strange species, they observed an Elæagnus with a Loranthus upon it, the leaves of both resembling each other in a remarkable degree, making it highly probable that a parasite growing in a similar manner gave rise to the very pardonable mistake of Griffith. Other anomalies of the same nature may doubtless be cleared up by a similar course of investigation. I have seen several species of Loranthus with aërial roots, but never one of the roots penetrating into the ground; and those roots I have only observed in climbing species having very slender branches, where they replace in a great measure the cirrhi, or hooks, with which climbing plants are generally furnished."

'*A Manual of Natural History, for the use of Travellers; being a Description of the Families of the Animal and Vegetable Kingdoms: with Remarks on the practical study of Geology and Meteorology. To which are appended Directions for Collecting and Preserving.*' By Arthur Adams, M.R.C.S.; F.L.S.; M.E.S., Stettin; William Balfour Baikie, M.D., F.B.S.E., late one of the Presidents of the Royal Medical Society of Edinburgh; and Charles Barron, Curator of the Royal Naval Museum at Haslar. London: John Van Voorst, Paternoster Row. 1854. Post 8vo; 750 pages. Price 12*s.*

This might be called the book with the *promising* title; but the promise is not confined to the title; and we feel sure that the authors

will not object to our citing, *verbatim et literatim*, the equally *promising* Preface. Here it is entire.

"The design of the following pages is to endeavour to supply what seems to be a blank in the scientific literature of this country, for, although numerous treatises exist upon every branch, yet no work has hitherto appeared, comprising either succinctly or in detail, a comprehensive outline of Natural History. It may appear be presumptuous on the part of the Authors to attempt to grapple with such an extensive range of subjects, which, they feel must be, in many instances, inadequately treated, still they trust that their effort to condense, within the limits of a portable volume, the leading features of Animate and Inanimate Nature, may prove of service to those at least for whom it is more especially intended. Their chief aim has been to render their work at once sufficiently popular for the general reader, without, at the same time, lessening its scientific value. For this purpose technicalities have been avoided whenever their employment could be dispensed with, English names have been given to all the Classes, Orders, and Families, and the principal divisions have been prefaced by brief introductory remarks. The classification adopted is that which has seemed most closely to accord with the advanced views of the time; and throughout the Animal and Vegetable Kingdoms a uniform system has been employed, so that similar subdivisions are designated by a cognate nomenclature."

Proceedings of Societies, &c.

Botanical Society of Edinburgh.

May 11, 1854.—Professor Balfour, President, in the chair.

Donations.

To the Library and Herbarium. — 'Proceedings of the Royal Society,' from Professor Sharpey; Norwegian plants from Dr. Anderson; British plants from Mr. Parker, Torquay; and Arctic plants from Mr. Lithgow.

To the Museum of Economic Botany at the Royal Botanic Garden.—From Daniel Oliver, Esq., strip of the bark of the cashaw (*Prosopis juliflora*), received from Jamaica, along with a note, stating that

the plant is one of the commonest trees in the Savannahs, and one of the hardwood Acacias. It yields a fine bitter, and is used by the people as a substitute for Cinchona. It is employed in certain chronic inflammations of the throat, and is said to be superior to Peruvian bark in its medicinal effects. The wood is constantly used for fuel.— From Messrs. W. & G. Law, merchants, Edinburgh, specimens of raw cocoa, ground cocoa, roasted cocoa, rock Trinidad, or navy cocoa, cocoa-nibs, Fry's chocolate, and a specimen of tea, known as Assam dust, which was stated to be scarcely known in commerce, and unnoticed by writers on teas. Messrs. Law remarked that it was a substance produced by friction during the process of preparing the tea. Leaves that are solid and heavy are the tenderest, and break the easiest; hence the quality of dust in Assam tea. This dust is too valuable to be thrown away, as it is often added to give strength to tea. — Other donations from Messrs. P. Lawson & Son, Mr. Andrew Murray, Mr. Robert Daw, Mr. G. S. Blackie, Professor Christison, Mr. George Waldie, Mr. W. H. Macfarlane, and Mr. Grant.

North-Uist Moss.

Dr. Greville mentioned that he had been in correspondence with Mr. Wilson upon the subject of the North-Uist moss, which had been referred by that gentleman to Leucodon Lagurus; while he himself had been disposed to consider it a variety of Hypnum cirrhosum. Mr. Wilson had, however, satisfied him that it could scarcely be so arranged. In the absence of fructification, Mr. Wilson preferred to regard it as a variety of Leucodon Lagurus (although there were certainly some differences of character), rather than unnecessarily to multiply species. Dr. Greville was still disposed, on the strength of the great difference in habit, to doubt of its claim to the place assigned to it; and thought it probable that the fructification, when discovered, would remove it altogether from Leucodon.

The following papers were read:—

Structure of Diatomaceæ.

'On the Structure of Diatomaceæ;' by E. W. Dallas, Esq., F.L.S.

The author directed attention to the list of species which follows, and which, although imperfect, exhibits great variety in the forms, showing the Medway to be very fertile in these organisms:—

Epithemia Musculus
Campylodiscus cribrosus
Surirella striatula
„ linearis
Tryblionella marginata
„ scutellum
„ punctata
„ gracilis
„ acuminata
Cymatopleura elliptica
Triceratium Favus
„ striolatum
„ undulatum
Cyclotella Kutzingiana
„ operculata
And three species undetermined
Actinocyclus undulatus
„ senarius
„ septenarius
„ octonarius
„ nonarius
Eupodiscus Argus, two vars.
„ radiatus
„ maculatus
Coscinodiscus radiatus
„ minor
„ eccentricus
„ Thwaitesii
And an undetermined species
Cocconeis Pediculus
„ scutellum
Nitzschia sigmoidea
„ dubia
„ reversa
And an undetermined species
Navicula elliptica
„ convexa
„ Westii (?)
„ didyma
„ pusilla
„ punctulata
„ palpebralis
Pinnularia divergens
Stauroneis pulchella
Cocconema parvum
Pleurosigma balticum
„ Hippocampus
„ angulatum
„ acuminatum
„ distortum
Doryphora Amphiceros, vars.
„ Boeckii
Achnanthes brevipes
Grammatophora marina (?)
Biddulphia aurita
Zygoceros rhombus
Dentricella sp.
Orthoseira sp.
Dictyocha
Bacteriastrum furcatum (?)
„ curvatum (?)

Some of the species in the foregoing list have been described as new to Britain by Mr. Roper, in a late paper, published in the 'Microscopical Journal.' The Coscinodiscus not named seems from the description to be the same with that found at the mouth of the Thames, and is an exceedingly beautiful disc. The four species of Actinocyclus are those described by Ehrenberg, and are new British species. They exhibit the strong siliceous cellular tissue underneath the moniliform structure of the surface, as in Actinocyclus. The examples of Triceratium striolatum, and also Zygoceros rhombus, dif-

fered somewhat from the figures and descriptions given of them, being provided with two spines placed close to the projecting terminations or angles of the valve, and which were always present in the examples that had come under observation. The surfaces of the valves were also seen to be dotted over with small nodules, which gave them a very remarkable appearance, and might be seen to project from the surface when the valve was suitably placed. These appearances might be attributable to a more matured developing of the silicious structure.

Among the remarkable forms found, although not considered to belong to the Diatomaceæ, are the two varieties of Bacteriastrum, the disks of which, it may be observed, were three or four times the diameter of those described by Mr. Shadbolt, from Port Natal, and the radiations more numerous.

Mr. Dallas directed attention to the structure of the Diatomaceæ, as affording some of the most beautiful examples of geometric arrangement of cells with which we are acquainted. It was pointed out that there are only three of the regular polygons that can be employed alone to fill up the space about a point in plane surface, namely, the equilateral triangle, the square, and the hexagon : these forms and their angles are accordingly found to prevail in the structure of the tissues. By constructing the polygons it was shown that they arranged themselves in straight lines, determined by the shorter axis of the figures, the quadrilaterals having two directions in which the lines run, and the hexagons three. With the hexagonal structure, when one set of the lines passing through the axis is referred to a centre, the cells then appear to radiate in straight lines from the centre ; while the other two directions in which they appear to rnn will be spiral lines, having a definite character according to the size of the cells. Much of the character of the tissue depends on the position of the axis of the polygon, with respect to an axis of the valve ; that is, whether the longer or shorter axis is parallel to it. Mr. Smith, in his ' Synopsis,' has noticed this peculiarity ; and, in accordance with it, has divided his genus Pleurosigma into two sections.

The above arrangements will be found to prevail in the structure of the tissues of the valves ; and the influence of the living principle might generally be seen in the repetition of like spaces, about a centre in each species, and always in the same numerical relations in each individual of the species, multiples of the numbers 2, 3, and 5, and also 7, seeming to prevail.

These divisions are seen very conspicuously in Actinocyclus and Actinopticlus. In the large species of Coscinodiscus the number of sectors appeared to be twelve, from the groups of rows at the centre, and in it was shown the very beautiful arrangement of the cells in radiating and intersecting spiral lines. Eupodiscus Ralfsii was referred to as affording an example of the division of the circle into sectors, within which the lines of cells are arranged symmetrically on each side of a single radiating row, to which the rest are all parallel. In Eupodiscus maculatus the disk is divided into ten; but the rows of cells do not converge towards the centre, except one at the side of each sector, to which the others are parallel. From this may be derived the very beautiful construction of the Coscinodiscus eccentricus, in which the disk is divided into seven sectors; the rows of cells extending across the valve from each sector, to meet similar rows from the second sector beyond.

Sections of Coal.

'On the various Sections of Coal, considered in their relation to the Block, and the relative views of Histologists thereon;' by Mr. Neil Stewart.

The author stated:—

"Since last July I have frequently been employed in making drawings of sections of coal, as seen under the microscope by transmitted light, and have therefore been obliged to give this subject some attention. In the prosecution of this work I have felt great difficulty in bringing to my aid the willing zeal so necessary to the spirited delineation, and which can only be commanded in proportion to the knowledge which the artist has of his subject. This I can only account for by stating, that a suspicion passed upon my mind, from the beginning, that something was wrong with regard to sections; and this suspicion, which I frequently mentioned to gentlemen engaged in the investigation of this subject, increased with my knowledge, until, on reading Mr. Quekett's paper, in the 'Microscopical Journal' for January last, I found that he there expresses a notion similar to mine, but immediately contradicts it by again returning to the usually received opinion. With a view, therefore, to satisfy my own doubts, and, if possible, to make a contribution to scientific truth, I have examined cubical blocks of various coals by direct light; and with my own hands have made sections from all the sides of these, and again examined them by transmitted light. I have also made drawings of such sections which are now before the Society.

"The first two drawings are representations of what are received as longitudinal and transverse sections of common household coal, to which, for the present, I shall confine my remarks.

"Professor Bennett expresses it as his opinion—and I believe he holds it in common with others — that the red coloured striæ seen in the longitudinal section are tubes or ducts; that the yellow rings seen in the transverse section are the ends of those tubes; and that the red colour of the tubes, like blood seen in the veins of the frog's foot, is an aggregation of the yellow bodies strewed over the section like blood-cells in single file.

"For a moment let us reflect upon the appearance presented by a cell or tube, as seen on the field of the microscope. In order that either of these bodies may be seen by transmitted light, a certain amount of transparency is necessary: the slightest curvature or undulation on the surface causes the light thrown from the reflector to be diverted from the eye of the observer, and the part so curved appears dark; this is invariably the case at the margins: the outlines of such bodies are distinctly defined and black, whatever may be their colour or form, and this blackness is diffused inwards according to their rotundity.

"How is it, then, that histologists have in this case departed from an invariable optical law, and have described appearances void of outline as cells and tubes? But even admitting them to be so, I would then ask, why have these not been carbonised like the adjacent structures which form the black mass? Wanting these two characteristics, no one need hesitate to say that they are neither cells nor tubes.

"With regard to the red colour being an aggregation of the yellow, it is enough simply to state that that is impossible, from two facts—the section is reduced to an equal thickness, and the yellow bodies occur within the red spaces, their definition being then as complete as when embedded in their usual black matrix.

"I have said that Mr. Quekett expresses a notion similar to mine, but again returns to the usually received opinion; here are his words: —'If a small cubical block of any kind of coal be examined under a power of fifty diameters, four of its six sides will exhibit more less of a fibrous structure, *precisely like that of wood.*'

"Now, if a block of wood and a block of coal be examined together, with the longitudinal striæ of each laid in the horizontal direction, they will present very different appearances. In the case of the wood it will be seen that only two of its sides, which I shall call the back and front, present the striated appearance; in the other two the ends

are distinctly transverse sections, and show the ends of organisms. But this is not the case with a block of coal, which may be likened to a pack of cards, the four sides in question having a similar appearance, and, so far as structure is concerned, having each an equal title to be called a longitudinal section. Where, then, is the transverse section of coal, and where are the yellow rings ?

" Hitherto our attention has been directed to the sides of the block, let us now examine the top and bottom, or horizontal surfaces—there the rings are found, and being there, cannot be the ends of the supposed tubes, nor have any relation to them, seeing that their longitudinal direction is that of the surface now under examination.

" I have drawn three sections, as if seen in one perspective view, in their natural position. The stripes on one side are seen to extend far into the side at right angles, showing themselves to be plates of transparent matter lying betwixt the carbonaceous layers.

" The grinding and polishing process is very instructive. On the sides of the blocks many series of rings may be ground off without much alteration on the appearance of the striæ, while in reducing the horizontal surface the transparent parts are constantly changing their form. The first evidence of transparency which presents itself is a deep blood-red spot, beautifully soft at the edges; grind a little farther, and it assumes the appearance recognized as the resinoid cell; a little more grinding, and the spore-case makes its appearance; still grind on, the process will be found to be as fertile of form as the frost is on the window-pane, or the burning embers of the fire to a musing fancy; and when the section is reduced to the last degree of thinness, the shallowest of all peep through. These are the yellow rings, with their dark centres, on which I shall venture a few observations suggestive of their origin.

" A painting of a transverse section, executed by Dr. Adams, of Glasgow, and shown by Professor Bennett to the Royal Society, represents the rings as if they were all in the level, and of a uniform colour. This has no doubt been in some measure the cause of their having been mistaken for the ends of tubes. Nature shows them different. Some are distinct and bright yellow, while thin as the section is when they come into view, others are still obscured by a layer of dark matter, and have a bister-brown colour. Mr. Quekett admits this to be the case; it is therefore a matter of astonishment that, with such a high and well-earned reputation for acute observation, he, at the same time, describes them as transverse sections of thick-walled cells or woody fibre.

"In the longitudinal section these bodies present their edges, are seen strewed all over the sections, and sometimes assume the appearance of an interrupted yellow line, and individuals now show their dark centres flattened.

"The dark bodies in the centres of the rings seem to me to be carbonised spores. I have figured some of the most distinct ones from different sorts. They have the characteristic outline of a cell — are some of them still quite spherical — and in Professor Balfour's specimen of Wigan cannel coal, where the edge of the section is reduced to a rag, some of them are partially divested of the encircling yellow, when the spore is seen to project into the empty field. The remains of some are also seen as black circular lines, sticking in the varnish with which the specimen had been fixed to the glass.

"The transparent yellow I suppose to have been pressed out in the process of carbonisation, or perhaps gathered round them as a pool of water encircles a stone on the sea-beach long after the retiring tide has left all else dry.

"In short, living vegetable matter, may with tolerable accuracy be considered as a semi-opaque substance. The process of carbonisation by which it is changed into coal, seems to separate the structural from the non-structural, the opaque from the transparent, and as the former is compressed and blackened, the latter is insinuated between the layers, and into every minute fissure and crevice left vacant around the more resistant particles of the carbonaceous mass; while decomposed portions are being constantly carried to the surface of the earth, by capillary attraction, there to be thrown off into the atmosphere or taken up by the minute spongioles and rootlets of the existing vegetation."

A paper was read by Mr. M'Nab, 'On the Effects of the recent Frosts on Vegetation, in different parts of the Country.'

Election of Members.

The following candidates were balloted for, and duly elected:— William Falla, Esq., 23, Dundas Street, as Ordinary (Resident) Fellow; Mr. George Morris, Golden Acres Nursery, as Associate.

Dublin Natural-History Society.

June 16, 1854.—James R. Dombrain, Esq., in the chair.

Saxifraga geum, &c.

Mr. Andrews said, that before commencing the papers for the evening, he was desirous of placing on record some plants that had been first noticed in this country at the meetings of the Society. The first was a very remarkable form of Saxifraga geum, fine specimens of which he submitted to the meeting. It was found by Mr. Andrews in the Great Blasket Island, in 1842, and noticed in the Society at the December meeting of that year. It was remarkable for its strong growth and dark hirsute leaves, but more particularly in the glands which surround the ovary, and which in the flowering state of the plant present a beautiful appearance, the glands being of a deep rose-colour. It seemed remarkable in connecting the Saxifragaceæ with the Parnassiæ and Crassulaceæ; it produces perfect seeds, and the seedlings present the same characteristics as the parent plant. Dr. Harvey, who took specimens to England, writes:—"Charles Darwin was very much interested in your Blasket Saxifrage, particularly at the fact of its producing perfect seeds. He is working out some observations on the continuability of varieties by seed, and wishes much to know whether the seedlings from this Saxifrage produce the metamorphic glands of the parent. I told him I thought they did, but would get the full particulars from you." My friend, Mr. Simon Foot, who cultivated the plant, confirms the fact of the seedlings having the same formation of glands as the parent, and informed me that Dr. Lindley observed to him that he considered it would prove to be a plant of great interest. Plants of Saxifraga Pedatifida, Arabis Crantziana, and Saxifraga leucanthemifolia were exhibited, as originally noticed in the Society; the two former discovered by the Right Hon. John Wynne, of Haslewood, the Saxifrage in Mayo, and the Arabis on Benbulben, Sligo. The Saxifraga leucanthemifolia, which exhibited numerous foliaceous buds on the flowering branches, and which, on falling off, became young plants, was brought by Dr. Scouler from Portugal. On flowering, the following year, this peculiarity in the plant was seen and brought forward, as it had not been noticed by any continental botanist. The plants do not perfect their seeds.

Combinations of Varieties in Ferns.

Dr. Kinahan made the following statement:—"In the paper read by me at our last meeting, I stated that on one point I was still in doubt, viz., how far varieties combine *inter se*. Since then I have been enabled to arrive at the following conclusions on this subject, opportunely indeed, as it completes the scheme I was endeavouring to lay before you:—I find that these combinations do take place occasionally, and that they, with a very few exceptions (more I am inclined to think seeming than real), take place only between the sub-groups of the same group, *i. e.* between variety and variety, and sub-variety and sub-variety. These conclusions, as well as those laid before you on former occasions, were all confirmed by examinations of, I believe, the two best collections of the kind in England, viz., that of Dr. H. Allchin, in London, and that of G. B. Wollaston, Esq., in Kent. Through the kindness of both these gentlemen, I have been much indebted both for information regarding the plants and by the opportunity afforded me of examining forms, many of them unique. In Mr. Wollaston's collection there is a form of hart's-tongue, raised by him from seed, which well illustrates the combination of forms. In it the lower portion of the frond represents the var. laciniatum, while the apex represents the var. cristatum. In one frond this was shown in a remarkable manner, the stipe was cleft, one portion was diminished to a fibrous hook, about a quarter of an inch long, the other bore a frond, the base marginate serrated and the apex divided into two, the one division cristate, the other reduced to a branched lash of bare fibrils. The establishment of this fact clears up the only difficulty in arranging the varieties I met with, establishing an additional class of mixed forms. Thus, the Athyrium found in Joyce Country by Robert Gunning, and figured by Newman, as well, I believe, as the form found by Mr. A. Smith, near Belfast, are to be referred to a form laciniato-cristatum, being a combination of laciniatum and cristatum."

Athyrium Filix-fœmina.

Dr. Kinahan exhibited a beautiful form of Athyrium Filix-fœmina, *Newman*, obtained in June, 1854, near Castlekelly, County Dublin. In it the segments of the pinnæ were pinnatifid; the indentations entire at their edges, and bearing the sori in the angle; the sporecases projecting beyond the edge of the frond, which, added to the bulging forwards of the substance of the pinnule, gave the plant

much the appearance of a Davallia, or rather of a Loxsoma, though, of course, differing in the shape and position of the indusium from either of these genera. In habit, this plant resembled Athyrium cicutarium, especially in the remarkable fact of its segments bearing but a single vein and sorus, thus corroborating the illustrious Robert Brown's opinion, who rejects this as a distinctive character, in opposition to Smith and Bernhardi, by whom the genus Darea or Cænopteris has, owing to this character, been separated from Athyrium. This plant is also a beautiful example of the variety laciniatum, *Kin.*: the plant was growing in a shady nook along with a plant of the ordinary form. It is sparingly fruitful.

Election of Members.

The Chairman then announced that the ballot should take place. There were the names of some distinguished men, that had been approved of by the Council, to be nominated Honorary Members. He should mention that it was a rule of the Society that "No person residing in Dublin, or within ten miles of it, can be elected as an Honorary Member of the Society."

The Chairman then announced that the following gentlemen had been unanimously elected Honorary Members: — Colonel Sabine, F.R.S., and President of the British Association; Thomas Bell, Esq., F.R.S., President of the Linnean Society; Sir William Jackson Hooker, K.H., &c., Director of the Royal Botanic Gardens, Kew; Edward Newman, Esq., President of the Entomological Society; J. O. Westwood, Esq., Ex-President of the Entomological Society; Joshua Alder, Esq.; and — Martin, Esq., Dublin, Ordinary Member.

The Session was then adjourned to November.

The Phytological Club,
(In connexion with the Pharmaceutical Society).

May 10, 1854.—Mr. Greenish in the chair.

The candidates proposed at the last meeting were unanimously elected Members of the Club; and a further accession of Members from different parts of the country was announced.

Mr. Greaves announced the receipt of specimens of the rare Draba aizoides from Mr. Gissing, of Worcester.

Mr. Cort exhibited specimens of Hymenophyllum Tunbridgense, and some specimens of pennywort, or Cotyledon. The plant, however, not being fully in flower, its further consideration was adjourned to the next meeting.

The Secretary read a communication from Mr. Gissing, of the proceedings of the Worcester Branch of the Phytological Club.

The Rev. J. H. Thomson, Honorary Member of this Branch, had discovered another undoubtedly wild habitat for Galanthus nivalis at Breedon, in Worcestershire, as well as a genuine habitat for the Daphne Mezereum. The early season, although warm, had been very dry, and had produced very few spring flowers. The hawthorn has been in blossom so early as the 14th of April.

Edwin Lees, Esq., F.L.S., Honorary Member of the Club, had delivered a lecture on 'The Geography of Plants,' to the Members of the Worcester Branch, at which there was a large attendance. (See Phytol. v. 139)

The Meeting was then adjourned to Wednesday, June 14.

The Phytologist Club.

One Hundred and Fifty-eighth Sitting. — *Saturday, June* 24, 1854.—Mr. Newman, President, in the chair.

The President read the following communications:—

Carex Davalliana, Sm., *near Bath.*

"In reply to several communications recently received respecting C. Davalliana near Bath, I can only state that my late friend, Mr. Edward Foster, informed me, shortly before his death, that the plant had long since been lost by drainage, when the Lansdown property came into the possession of the late William Beckford, Esq, of Fonthill. I visited the locality in the summer of 1852, and found all traces of it destroyed."—*T. B. Flower; Seend, near Melksham, May*, 1854.

Draba muralis, Linn., *near Bristol.*

"I have recently seen this plant growing at Henbury, near Bristol, where it has been observed for many years past by Miss Powell, who kindly conducted me to the spot; not having been recorded before, induces me to note the circumstance."—*Id.*

Carex dioica, Linn., *near Bath.*

"This plant was shown me by Mr. Walker, of Bath, a few years previous to his death, as being found by him within four miles of that city, and recorded on his authority in Babington's 'Flora Bathoniensis;' not being aware of its having been found since in the County by any other botanist, induces me to record this fact, from observing in the 'Cybele' a doubt expressed as to its occurrence in the *Peninsular*. And I may here remark that Mr. Walker's au-authority could be relied on, having cultivated the rarer British plants in his garden, at Bath, for many years."—*Id.*

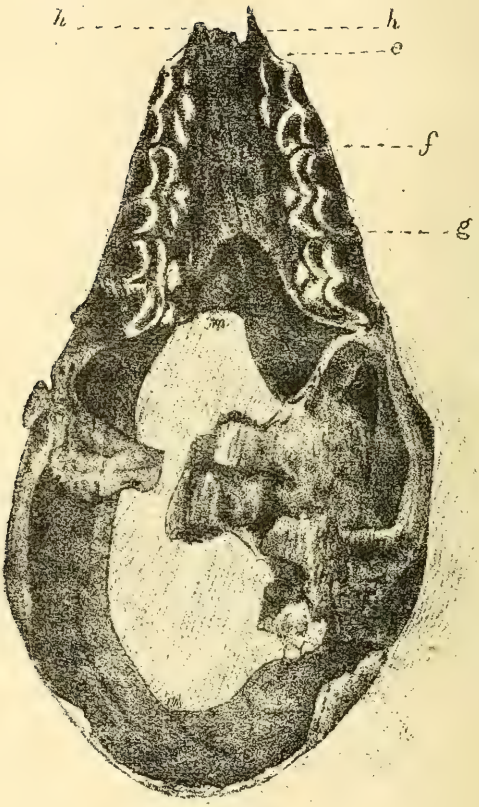
Herbarium of Rhenish Menthæ.

Dr. Philip Wirtgen, of Coblenz, is about to publish a Herbarium of the Menthæ of the Rhine, to include all the species, varieties, forms and hybrids hitherto collected in the neighbourhood of that river. The specimens, correctly named and accompanied by various critical notes, will be fastened on white paper, and form a thick folio volume. Each set is offered for 16*s.*, and any person desirous of becoming a subscriber is requested to signify his intention to Dr. Berthold Seemann, Kew, near London.

Viola lactea and Viola flavicornis (?)

"The following may be added to the list of unrecorded localities for the Viola lactea; Mayal's Green, Gower, Glamorganshire, (from which place I enclose a specimen). I have carefully noted this plant, and also the V. flavicornis (V. canina var. minor, of Hooker), and while I cannot but come to the conclusion that the first (V. lactea) is a distinct species, I feel convinced, so far as my present observation extends, that the so-called V. flavicornis is the simplest form of a variety of V. canina, namely, a form which is respectively transmutable by corresponding changes of soil and circumstance: and which may be met with in the neighbourhood of the supposed localities of the V. flavicornis in every intermediate stage of development."—*Caroline Catherine Lucas; Mayals, May* 20, 1854.

PLATE IV



The Botany of the Chesil Bank, Portland.

By W. B. Barrett, Esq.

The Chesil Bank, which connects the Peninsula of Portland, in the county of Dorset, with the mainland, has long been considered as one of the most extraordinary ridges or shelves of pebbles in Europe, and is perhaps the longest, except that of Memel, in East Prussia. It extends from Abbotsbury to Portland, a distance of ten miles and three-quarters, and its direction is S.E. and N.W. The bank commences at Abbotsbury, and in about half a mile meets the Fleet Water, a narrow arm of the sea, varying from a quarter to half a mile in width, and running between the Chesil Bank and the mainland, until it communicates with the sea just below the Portland Ferry Bridge. The average width of the bank at low water is 170 yards at Abbotsbury, and 200 yards at Portland. The pebbles, which are generally known by the name of Portland pebbles, consist chiefly of flints from the chalk. They are so loose that horses sink almost knee-deep at every step, and walking on them soon becomes sufficiently laborious to require a considerable degree of enthusiasm for the careful examination of the products of this pebbly bank.

Much interest has of late been created respecting the formation and nature of the Chesil Bank, in consequence of a very excellent paper by John Coode, Esq., the resident engineer of the Portland Breakwater, which was read at a meeting of the Society of Civil Engineers a short time since. It may possibly not prove uninteresting to give some account of the principal plants which are found on this beach.

We propose to start from the south-eastern part of the beach, that part which adjoins the Peninsula, or, as it is more commonly called, the Island of Portland; and we shall beg the reader to accompany us, on a fine morning in the middle of August, along the beach to its junction with the mainland at Abbotsbury, a somewhat fatiguing ramble, it is true, but one which will be well repaid by the many objects of botanical interest that will come under our notice. We shall confine ourselves almost entirely to the eastern side of the bank, which for some distance skirts the Fleet Water, it being by far the firmest and easiest for walking, in consequence of the pebbles being somewhat bound together by the marine plants growing in patches along the water-side, and by the Zostera thrown ashore by the sea; whilst the western side, being fully exposed to the heavy breakers which roll in from the Atlantic, is quite bare of vegetation, and very loose. Close

to Portland one of the first plants we find is by no means a common one: it is the bird's-foot trefoil (*Trifolium ornithopodioides*), which occurs rather sparingly in dry, sandy spots. The rose-pink blossoms of the sea-bindweed (*Convolvulus Soldanella*) and the thrift or sea-pink (*Armeria maritima*) are conspicuous amongst the moss which covers much of the ground near the road; and here, also, we may notice the stately sea-holly (*Eryngium maritimum*), which grows very luxuriantly. The Danish scurvy-grass (*Cochlearia Danica*) skirts the road nearly all the way to the Bridge. The four-leaved all-seed (*Polycarpon tetraphyllum*), first found by Mr. Hudson, and afterwards by Mr. Lightfoot, in Portland, was also discovered here by Mr. A. B. Lambert. This, however, is only one of several plants, formerly found on this beach, which are now seldom, if ever, to be met with. We must not, however, forget to notice the rare Festuca uniglumis, almost peculiar to the sandy shores of the South of England, which may be seen here by the roadsides, together with the hemlock stork's-bill (*Erodium cicutarium*), the blossoms of which are often almost white, and the buck's-horn plantain (*Plantago Coronopus*), which, with the little thyme-leaved sandwort (*Arenaria serpyllifolia*) are very common.

A narrow tract of sand and shingle stretches out on our right, extending someway East of the Ferry Bridge; and now our attention is attracted by the luxuriant profusion of the sea-spurge (*Euphorbia Paralias*). The Portland spurge (*Euphorbia Portlandica*) also occurs, but more sparingly, although in Portland it is very common. The handsome blossoms of the yellow-horned poppy (*Glaucium luteum*) render the sea-shore gay though the summer months. Dr. Maton, in his interesting 'Observations on the Western Counties of England,' published in the year 1797, vol. i. p. 54, writes, "Just after crossing the Ferry, Asparagus officinalis appears, but very sparingly, and so diminutive that it may easily escape observation." We have in vain searched for this plant, and we much doubt whether it is now to be found in this locality. The sea-kale (*Crambe maritima*) formerly grew abundantly on the Chesil Bank, as appears by Hutchin's 'History and Antiquities of the County of Dorset,' 2nd edit. vol. ii. p. 364; but he states that in his time it was nearly all destroyed, and we now find no traces whatever of it.

Crossing a broad belt of wet sand and mud on our left, we meet with the sea Schoberia (*Schoberia maritima*), and on the beach the more rare species, the shrubby Schoberia (*S. fruticosa*). A sea-shore umbel-bearer, the sea-samphire (*Crithmum maritimum*), peeps up

between the pebbles; whilst the corn sow-thistle (*Sonchus arvensis*) forms a golden fringe along the water's edge, interspersed here and there with the sea-rocket (*Cakile maritima*) and the prickly saltwort (*Salsola Kali*), both of which are plentiful. The sea-rocket is a hardy plant, and is sometimes seen in full bloom on this coast in the beginning of January, and is then certainly one of the most beautiful of our wild flowers. The sea-feverfew (*Pyrethrum maritimum*) and the common knot-grass (*Polygonum aviculare*) are amongst the plants growing near the water's edge; whilst higher up the bank, and almost to its summit, there is a profusion of the sea-campion (*Silene maritima*) and Glaucium luteum. That very rare plant, Glaucium phœniceum, said to have been formerly found in Portland, is now no doubt extinct.

The chief attraction, however, of this part of the beach is the rare and beautiful sea-side everlasting pea (*Lathyrus maritimus*). It does not grow close down to the water, but prefers the loose pebbles of the higher parts of the bank, where it may be seen in large patches along the beach almost from the bridge to the village of Fleet; shortly after which it disappears for several miles, but again becomes abundant near Abbotsbury. This is the sea-pea of which Gerarde gives an amusing account in his 'Herbal.' He says:—"I finde mention in Stowe's Chronicle, in anno 1555, of a certain Pulse or Pease, as they term it, wherewith the poore people at that time, there being a great dearth, were miraculously helped: he thus mentions it; in the moneth of August (saith he) in Suffolke, at a place by the sea-side all of hard stone and pibble, called in those parts a shelfe, lying betweene the townes of Oxford and Aldborough, where neither grew grasse, nor any earth was ever seene: it chanced in this barren place suddenly to spring up without any tillage or sowing, great aboundance of Peason, whereof the poore gathered (as men judged) above an hundred quarters, yet remained some ripe and some blossoming as many as ever there were before: to the which place rode the Bishop of Norfolk, and the Lord Willoughby with others in great number, who found nothing but hard rockie stone the space of three yards under the roots of these Peason: which roots were great and long and very sweet." He also adds, "My Worshipfull friend Dr. Argent hath told me, that many yeares ago he was in this place, and caused his man to pull away the beach with his hands, and follow the roots so long untill hee got some equall in length unto his height, yet could come to no ends of them."

The sea-radish (*Raphanus maritimus*) has been found sparingly on

this part of the beach. Among the sand and firmer pebbles we shall not fail to notice the sea-beet (*Beta maritima*), the origin of the sugar-yielding beet, which is very frequent. Geranium purpureum sheds its petals plentifully over the loose stones amongst which it grows, forming a striking contrast with Glaucium luteum and Silene maritima. A few feet from the shore, on our right, are vast beds of the broad-leaved grasswrack (*Zostera marina*), which extend to Abbotsbury. Just opposite the Coast Guard Station at Fleet we find a little plant not unfrequently met with in sandy places in some parts, but which is rare on this coast: it is the knotted pearlwort (*Sagina nodosa*). It occurs but sparingly, and may be easily overlooked. Dr. Pulteney, in his 'Catalogue of the more rare Plants of Dorsetshire,' p. 88, states that he had been informed that the marsh-mallow (*Althæa officinalis*) grew "about Portland, and by the Fleets of the Chesil Bank.' Dr. Maton, in his 'Observations on the Western Counties of England,' writes, "Lavatera arborea (tree mallow) will attract the notice of the botanist among the neighbouring eminences at Portland." Ray, also, records this plant in Bishop Gibson's edition of 'Camden' as a native of Portland and of Chesil Bank; and Dr. Pulteney adds that in his time it continued to be found there, and had been from thence introduced into the gardens of the villages of the island and the neighbourhood. Neither of these plants, however, have we been able to find; and we much question whether they have not now disappeared from this neighbourhood.

Between Fleet and Langton, in sandy or muddy places overflowed at high water, we may notice most of the salt-marsh plants: there is the sea-starwort (*Aster Tripolium*), now in full bloom; and close by is the jointed glasswort (*Salicornia herbacea*), and here and there a sprinkling of the sea-milkwort (*Glaux maritima*), the rose-coloured flowers of which have now almost disappeared. The sea arrow-grass *Triglochin maritimum*) grows in company with the sea-plantain (*Plantago maritima*), or with the sea sandwort-spurrey (*Spergularia marina*), where the soil is very wet. Further from the water's edge, and in a drier sandy soil, the biting stonecrop (*Sedum acre*) abounds; there, too, we find the kidney vetch (*Anthyllis vulneraria*) and several composite plants, such as half-starved specimens of the autumnal hawkbit (*Apargia autumnalis*) and the hairy Thrincia (*Thrincia hirta*), and where the clay appears the colt's-foot (*Tussilago Farfara*) is found. The prickly twig-rush (*Cladium Mariscus*) has also been found here.

The most striking feature, however, of the Botany of this part of

the beach is the abundance of Schoberia fruticosa. It grows to a considerable size, and many of the stems exceed three inches in circumference. This plant, with the various species of sea-purslanes, constitute by far the greater part of the vegetation for several miles. Of the sea-purslanes the shrubby orache (*Atriplex portulacoides*) is the most abundant; the spreading halbert-shaped orache (*A. patula*) and the spreading narrow-leaved orache (*A. angustifolia*) are both common; the grass-leaved sea-orache (*A. littoralis*) occurs much less frequently. Triticum junceum is not uncommon, nor are several other plants that we should scarcely have expected to find on such a beach as this, the seeds of which, however, appear to have found their way from the land on the opposite side of the Fleet. Such are the bramble, and the docks which crown the higher ridges of the beach, and here and there a dwarf willow, sheltering beneath its branches a stunted plant or two of the hemlock (*Conium maculatum*) and the rough chervil (*Chærophyllum temulentum*). The sea-pea, which we had not observed for the last mile or two, now grows more luxuriantly than ever, covering the side of the beach a great part of the way to Abbotsbury. Atriplex littoralis, also, occurs more frequently. We have now reached the Swannery, and are opposite Abbotsbury; the Fleet suddenly contracts, and we soon reach its narrowest part; and at length it terminates in a broad morass or salt-marsh, where we recognise a mixture of the meadow with the sea-shore plants, such as the comfrey, the reeds and sedges. Plantago maritima occurs so plentifully that it forms the principal herbage of one of the adjoining fields.

In conclusion, it may be remarked that we have found no traces on the Chesil Bank of Vicia lævigata, discovered by Mr. Hudson on the beach at Lodmoor, near Weymouth, and said to have been found among the shingles on the Chesil Bank, and in Portland by Sir J. Cullum; nor have repeated searches on the beach at Lodmoor of late years been more successful. These were the only stations recorded for this species in the whole world; and there seems now little doubt of its being extinct.

W. B. Barrett.

Weymouth, October, 1856.

Remarks on the New Method of Arranging Ferns.

By Edward Newman.

Part I.—History of the New Method.

Systems in Natural History are the results of methodizing observations. The decadence of systems arises either from our having assigned too great importance to the facts observed, or from our observations having been imperfect. The latter alternative is self-evident; the former may be made more clear by the following illustration:—A naturalist finds himself possessed of a multitude of shells; he makes a thousand observations on their wonderfully and beautifully varied forms; he classifies them; form of shell is the basis of his classification. Another naturalist goes to the sea-coast; he finds the animals that inhabit the shells; and he finds other animals very much like the inhabitants of the shells, but without shells; he makes a thousand observations on the forms of the animals; he then constructs a classification of the animals independently of their shells. Learned men come forward and say to this second observer, "Thou art right: *rem acu tetigisti.*" But what security have we for this? May not there arise a more profound observer than either of these? May not some anatomist examine the intimate structure of the animals, the circulation of their blood, their mode of respiration and generation; and, founding a system on these, may he not supersede both the previous systems? Linneus, with that wisdom for which all his writings are so remarkable, seized on those organs in plants which are developed for the most important of physiological functions; but he laid too great stress on number; and on this account the most important character of all was superseded by Jussieu's appeal to intimate structure and mode of growth. Linneus is deposed and Jussieu enthroned, because Linneus made his system arithmetical, not because the mode of growth was of more importance than the mode of generation. But it must never be overlooked that this arithmetical mode is much the easiest both to teach and to learn; and teachers will long be found who are not only unwilling, but unable, to grapple with intimate structure and physiological facts; and these, as a matter of course, will pillow their heads on a system where the ability to count twenty is the great desideratum; and this they will pretend to do as disciples of Linneus. They load with their praises both Linneus and his method, not because of the profound wisdom of that method, but because the application of the

method comes within the range of their capacities. Captivated by the readiness with which the Linnean method of counting the organs of reproduction could be applied to the phænogams, it was not illogical to conclude that the same organs would afford equal assistance among the cryptogams: *ex uno disce omnes* was the motto; but the authors who so unhesitatingly adopted it seemed perfectly unaware of the existence of a stumbling-block at the very threshold of the inquiry. The sepals, petals, stamens and pistils, so patent, so readily countable in the phænogams, were either non-existent or undiscovered throughout the whole of the cryptogams; and systematists, instead of appealing to these parts, appealed to what they supposed would answer the purpose equally well. Sepals and petals were not to be seen; but botanists supposed their representatives to exist in the monotonously isomorphous gemmules which dot the back of a fern-leaf. These, as we all know, are associated in clusters; and these clusters are sometimes round, and sometimes linear; sometimes naked, sometimes covered by a portion of epidermis; sometimes discal, sometimes marginal. On these differences a system was invented by Sir James Edward Smith; and with this system the students of ferns are generally satisfied at the present day.* A system which, leaving the mere surface, should enter more fully into the inner life of the plant is, therefore, day by day growing more requisite and a more indispensable desideratum, especially amongst those who perceived and were ready frankly to appreciate the brilliant light thrown on the study of phænogams by the observation, that in some the increment in bulk was occasioned by the formation of new substance in the centre of the stem, and in others by the formation of new substance on the circumference of the stem,—a simple observation truly, but one which caused the almost immediate division of phænogams into Endogens and Exogens.

This radical difference, so to speak, in a physiological character, can scarcely be confined to the phænogams; and, inquiry having been once diverted from its original channel into one so totally new and unlooked for, it was to be expected that an extended application of the principle would be attempted in other portions of the world of plants. This has been the case.

* It is not worth while to go back to the pre-Linnean era of Botany, or we should find Sir J. E. Smith's system of ferns proposed by Ray.

Gaudichaud, 1826.

The first proposition for such an extension of the theory was made, in the direction of the ferns, by Charles Gaudichaud, in Freycinet's 'Voyage autour du Monde executé sur les Corvettes l'Oranie et la Physicienne,' published in 1826. That accomplished botanist observes that the structure and mode of growth, both of rhizomes and stipes of ferns, are of so many and such distinct kinds that they compel us to divide those plants in the following manner:—

"Class I. Fougères a tiges rampantes ou grimpantes seu rameuses: elles se subdivisent en deux ordres.

"Order 1. Tiges rampantes, charnues, tendres, aqueuses et cassantes tant qu'elles sont vivantes, offrant des leur coupe transversale plusieurs lignes de vaisseaux fibreux medulliformes colorés." The examples given are the genera Hymenophyllum, Trichomanes, Polypodium, Pleopeltis, Adenophorus.

"Order 2. Tiges rampantes, grimpantes, ou volubiles, ligneuses ou fibreuses, sèches, tenaces, même à état frais, souvent rameuses et n'ayant, qu'une ligne centrale de vaisseaux medulliformes colorés figurant très bien un canal medullaire." The examples are Gleichenia, Lygodium, Mertensia.

"Class II. Fougères a tiges simples, ascendantes: elles se subdivisent aussi en deux ordres.

"Order 1. Tiges compactes, dures, ordinairement droites, chargées exterieurement d'impressions diverses." This order contains the true tree-ferns.

"Order 2. Tiges aggrégés ou fasciculées: elles se composent de la base persistante des petioles (stipes) disposée et fixée autour d'une axe central qui est la tige réelle. Le diamètre de cet axe varie selon les espèces." Asplenium Ruta-muraria, Athyrium Filix-femina, Dryopteris Filix-mas, Blechnum spicant and Notolepeum Ceterach are given as examples of this order.

Presl, 1836.

It must also be noticed in this place that Presl, whose knowledge of the subject has never been called in question, and whose very name

conveys an idea of all that is eminent in Pteridology, arrived at the conclusion that the involucre did not afford satisfactory characters; and he consequently sought, and believed he had found, in the different distribution of the veins, diagnostics which would make the subject simple and intelligible. After vindicating the importance of veins generally in all plants, and comparing them to the skeleton of vertebrate animals, he goes on to assert their paramount importance in ferns. "Hæc vasa in organis foliaceis Filicacearum tanquam costæ, venæ et venulæ palam fiunt, et ex supra allatis causis maximum in describendis dividendisque Filicibus possident argumentum. Filicaceæ compage venarum anatomica ab omnibus aliis vegetabilibus phanerogamis quam maxime differunt; hac ex causa venæ Filicacearum characterem essentialem et validissimum ex interna structura harum plantarum desumtum præbent." Presl, also, was well acquainted with the diversified structure of the rhizome, and with the previous observations of Link, Mohl, Gaudichaud and Treviranus, only one of whom I have cited, because the others have not so methodized their researches as to render them available for classification. Presl writes thus on the "caulis:"—"Caulis Filicacearum, induat nunc formam rhizomatis nunc caudicis, componitur e textu celluloso regulari ac magno parenchymatoso et prosenchymatoso vasa involucrante. Vasa hæc constituuntur e vasis scalariformibus et porosis paucis cellulis parenchymatosis intermixtis, et strato cellularum prosenchymatosarum plerumque parietes crassas possidentium in provectiore ætate ut plurimum fuscarum vel atrarum nitentium includuntur et a parenchymate adjacente cryptas rubra materie repletas continente dividuntur." The entire passage is not germane to the question of employing the mode of growth as a character, but is happy in showing that this great master fully appreciated the difference between a rhizome and a caudex.

In taking leave of Presl it is necessary to state that his system is framed on a combination of characters, the venation being the prominent feature. He makes five orders, under the names of Filicaceæ, Hymenophyllaceæ, Marattiaceæ, Osmundaceæ and Ophioglossaceæ.

John Smith, 1854.

Mr. John Smith, of the Royal Botanical Garden at Kew, has for many years entertained the idea that the mode of growth in ferns should be employed in their classification. Although his views did not for some time receive the stamp of authenticity given them subsequently, by publication under his own name, yet it was well known

that he entertained them; and they were incidentally mentioned in print both by Dr. Seemann and myself. Mr. Smith's matured views on the subject were first published in the sixth Part of Dr. Seemann's 'Botany of the Voyage of H.M.S. Herald,' at p. 226, in the following words:—

"In this enumeration I have followed the arrangement published by me in Hooker's 'Journal of Botany,' vol. iv. p. 46 *et seq.*, except in such cases where later observations and altered views have rendered changes necessary. In my enumeration of the ferns cultivated in the Royal Botanic Gardens at Kew ('Botanical Magazine,' vol. lxii. 1846) I arranged the species of Polypodium under four sections, characterized by the different modes in which the fronds are developed and attached to the axis of growth (vernation). The first of these sections contains Polypodium vulgare, which, with its allies, presents a mode of growth quite different from that of those species constituting the other three sections; the three latter I now consider as presenting only different modifications of another and more general mode of growth; and although all the species of the four sections agree in the technical character of Polypodium, in having punctiform naked sori seated on free veins, yet the two different modes of growth found in the various species of Polypodium appear to me to be quite sufficient to warrant a separation of the species under distinct genera. I therefore restrict true Polypodium to those species having the same kind of vernation as Polypodium vulgare. The genus may then be viewed as representing a natural group of ferns having the following characters:—The fronds are developed from the sides of a special rhizome, which has its axis of growth always in advance of the nascent frond (excurrent); the fronds are produced from nodes more or less distant from each other, each node producing a single frond, which, after having arrived at maturity, separates by a special articulation formed between the node and the base of the stipes; after the frond has fallen, the node remains in the form of a round, concave cicatrix, generally more or less elevated; the rhizome is solid, fleshy and brittle, varying from long and slender to more or less short and thick, and is always covered with scales, which, unless they are common to the whole frond, seldom extend upwards beyond the node. This mode of development, which I have termed Eremobrya, is peculiar to a considerable number of Polypodieæ, including genera with both free and anastomosing veins; also a portion of Davallia, of which D. Canariensis may be viewed as the type, the whole forming a truly natural group of ferns. The other mode of development

to which I have alluded, and to which I have given the name of Desmobrya, is observable in a more numerous group of ferns, bearing the following characters:—The fronds form a terminal axis, either in a single alternate series, or in a fascicle forming a corona; each succeeding frond is produced on the interior side of the bases of the preceding fronds, the bases being united and adherent; by the successive evolution of fronds a progressing accessory stem or cormus is formed, which varies in being decumbent or erect, short or more or less elongated, often assuming the aspect of trees, or, creeping on or under the surface of the ground, forming cæspitose tufts: in those species producing their fronds in a single series the developing axis sometimes elongates before the evident evolution of the fronds, which are then more or less distant from each other, and by this mode of growth forming a creeping or scandent caudex, which often assumes the character of a sarmentum, and then appears to agree with the mode of growth I have called Eremobrya, but it is readily distinguished by the epidermis and vascular structure of the stipes being continuous and united, forming part of the developing axis, and not being articulate as in Eremobrya. The various modifications of the structure observable in the group Desmobrya often mark the limits of what I term natural genera. Desmobrya therefore includes part of the Ctenopteris, and the whole of the Phegopteris groups of Polypodium; also Gymnogramma, Goniopteris, Meniscium, and other genera of Polypodieæ; the whole of Pteridieæ, Asplenieæ, and, with a few exceptions, Acrostichieæ, Aspidieæ, Dicksonieæ, and Cyatheæ.

"I have here stated the obvious characters observed on examining examples of the two modes of development; the differences become more evident on examining their internal structure. I cannot enter into details in this place, the present collection not affording sufficient materials, nor the work space, to enable me to state the changes in affinity that will become necessary in consequence of adopting this mode of arrangement. I will only further mention, that, although the two modes of growth are in general readily determined, yet in some cases, especially herbarium specimens, it is a more difficult task. The genus Woodsia is peculiar, on account of the stipes of the original species having an articulation at a distance above the axis of vernation; nevertheless, as the vernation is terminal, and the bases of the stipes adherent, Woodsia must be referred to Desmobrya."

It may be observed that the Flora of Panama is comparatively poor in ferns; but those who are acquainted with Mr. Smith's catholic

knowledge of the subject will not assume that the paucity of species caused the author any difficulty, or interfered at all with his arrangement, which I give, exactly, below:—

"Tribe I. Polypodieæ.

* Desmobrya. Fronds in vernation terminal, their bases adherent, united with and constituting the axis of growth.

Genera. Xiphopteris, Ctenopteris, Gymnogramma, Leptogramma, Phegopteris, Goniopteris, Meniscium, Tæniopsis, Pteropsis, Dryomenis.

** Eremobyra. Fronds in vernation lateral, solitary, and ultimately separating from the axis by a special articulation.

Genera. Lopholepis, Lepicystis, Goniophlebium, Pleopeltis, Campyloneurum, Phymatodes, Dicranoglossum.

Tribe II. Acrostichieæ.

Genera. Elaphoglossum, Rhipidopteris, Polybotrya, Gymnopteris, Acrostichum.

Tribe III. Pterideæ.

Genera. Notholæna, Cheilanthes, Adiantum, Litobrochia, Pteris, Blechnum, Lomaria.

Tribe IV. Asplenieæ.

Genera. Hemidictyon, Asplenium.

Tribe V. Aspidieæ.

Genera. Aspidium, Nephrodium, Lastrea, Polystichum, Cyclopeltis.

Tribe VI. Dicksonieæ.

§ Lindseæ.

Genera. Lindsæa, Dictyoxiphium, Dicksonia.

§ Trichomaneæ.

Genera. Trichomanes, Hymenostachys, Hymenophyllum.

Tribe VII. Cyatheæ.

Genera. Hemitelia, Cyathea, Alsophila, Amphidesmium.

Gleicheniaceæ.

Genus. Mertensia.

Schizæaceæ.

Genera. Lygodium, Schizæa, Anemia, Anemidictyon, Danæa."

Reflections on these Systems.

Now, here is the remarkable case of three men, who have made the study and classification of ferns the leading object of their lives, who have given these plants in a living state their most attentive consideration, independently arriving at the conclusion that the parts of fructification did not afford characters whereby to divide ferns into primary and secondary groups, and substituting characters derived either from the mode of growth or the distribution of the veins. This concord cannot, surely, arise from any other cause than the fallacy of theory which they agree to ignore; still it is not a little remarkable that all three have relapsed into the beaten track, and in their definitions have mainly depended on the mode of fructification for their characters. Presl has no deviation from the ordinary method, except that in his genera the veins are fully and admirably characterised; Gaudichaud relapsed quite into the old formula, although his primary definitions are so strikingly attractive and so apparently incontrovertible; and Mr. Smith alone remains of the three as having given any extended application to a character which he has defined in so masterly a manner. But even Mr. Smith's extension of the theory is insufficient: while he acknowledges the importance of considering the mode of growth, he confines the application of that character to the genus Polypodium, or to those ferns which, to use his own expression, "have punctiform naked sori seated on free veins." I agree, then, rather with Gaudichaud in making the application of the character universal, than with Mr. Smith, who appears to restrict its application to a group which has no existence in nature, and of which the very definition is sufficient to show that it is a me e artificial assemblage. I would also observe that I scarcely understand the rank which Mr. Smith would assign to his groups Gleicheniaceæ and Schizæaceæ, which are typographically so arranged as to constitute integral portions of the Cyatheæ, a station for them which I am persuaded is diametrically at variance with nature. But whether Mr. Smith intended this, or would constitute them primary groups equivalent to those seven which he has called tribes, is of little moment: both modes of disposing of them appear equally objectionable.

Having thus stated, and I trust in a fair and candid manner, the views and labours of others in this interesting field of inquiry, I will

proceed to explain my own, incorporating occasionally the valuable observations of the authors I have named; for I believe it impossible to study, and appreciate, and accept as true the labours of others, without their becoming so engrafted on your own that it is difficult, if not impossible, to restore each idea to its original owner. So small is my desire to be regarded a discoverer or innovator on this interesting question, that I would have adopted the method of either of the great botanists I have mentioned far rather than proposed another, had either of them united the two great desiderata—1st, of making the application of the theory general; 2ndly, of carrying out the same theory in detail.

My own misgivings as to the value of the involucre in classifying ferns date from 1837, when I first attempted the study of the British ferns. These misgivings first found expression in print in this Journal, in 1842, and were systematized with some precision in the Introduction to the third edition of the 'History of British Ferns,' in 1854. Up to that period I was in total ignorance of Gaudichaud's views, and was so far mistaken in Mr. Smith's as to suggest that my divisions Rhizophyllaceæ and Cormophyllaceæ were equivalent to his divisions Eremobrya and Desmobrya; whereas his subsequently published system, as already stated, shows that Mr. Smith's Eremobrya equals my genus Ctenopteris, and his Desmobrya my genera Gymnocarpium and Pseudathyrium united. I am quite ready to admit that my views have undergone considerable alteration and modification during the twenty years that I have been applying myself to the subject, and therefore that a critic might discover discrepancies in my printed opinions; but I have no more idea of regretting or apologizing for these alterations and modifications of opinion than I have for the very obvious truth that I am twenty years older now than when I began.

Part II.—The New Method.

Plants, generally speaking, are composed of four obvious parts—roots, stems, leaves and flowers. The roots, stems and leaves seem to subserve the offices of support, nutrition and respiration; in a word, to be provided for the preservation of the individual: the flowers seem to subserve the office of generation alone, and therefore to be provided exclusively for the preservation of the species. Now, these purposes are absolute requirements in all created beings, and are as

obviously the attributes of ferns, which have no flowers, as of phænogams, which have. These two objects or purposes are always closely connected, often so elaborately interwoven as to be confounded in our short-sighted investigations; yet are in every instance found to be distinct and independent, if the inquiry be carefully and skilfully conducted. The frond or leaf, which in ferns normally bears the fruit on its back, does not, on this very account, seem, at first sight, so distinct an organ as the leaf of a phænogam, for it appears to occupy a somewhat neutral ground between the preservation of the individual and the preservation of the species; this difficulty, however, is dispelled by the consideration that those ferns which have fronds entirely covered with fructification have other fronds also on which no fructification whatever appears. There can be no doubt that such unfruitful fronds perform the office of leaves; and hence we may fairly assume that those leaves which contain the receptacle of the fruit also perform the same office.

Having thus indicated the existence of two classes of functions, and the provision of *appareils* or systems of organs adapted to each, it would become necessary to weigh the claims of both, were it not obvious that the system of generation or preservation of the species must have the greater claim on our consideration; but no sooner do we seek guidance from this than we find the physiological characters of generation, as far as we know them, exactly alike in all ferns; and we feel disinclined to regard the slight differences in external form and condition of the clusters of capsules as of sufficient importance for the establishment of divisions. * We are therefore compelled to

* In cryptogams we have a succession of individuals somewhat different to that recognised in phænogams; for each individual appears to produce its kind without the intervention of a second individual: and the definition given to a species in the animal world, and which is partially true also in phænogams, is not true, as far as we have yet ascertained, in cryptogams, where each individual appears as the parent of a race. This, perhaps, accounts for the extreme difficulty in fixing the limits of a species in ferns, and is likely to lead to the unnecessary multiplication of species; for it is quite certain that a homogeneity of appearance will, and does, constantly occur on mountain ranges, another homogeneity of appearance in the individuals found in a wide range of bog at a lower elevation, and a third homogeneity in individuals occurring under the shade of a forest; and in every instance this appearance may be due to the isolation, for many centuries, of an individual and its descendants, which continue to reproduce their kind under peculiar conditions of soil, altitude, temperature, exposure, and so forth. This difficulty appears very often to have been unnecessarily magnified; for, except as a question for the consideration of speculative theorists, it really matters very little whether two individuals grown under different natural conditions are representatives of races, local varieties or closely allied species.

have recourse to a system of organs in which the diagnostic characters are more strongly pronounced. This is the case in that permanent portion of a fern known under the different names of caudex, cormus and rhizoma: the roots are almost uniformly fibrous and similar; the form of frond is infinitely varied; the caudex possesses an intermediate station as to variation, and its variations are such as imply different physiological conditions; it is therefore the organ to which the botanist must look for permanent and obvious differences. It is impossible to give this organ a careful examination without being struck with the fact that it has two totally dissimilar modes of development in those plants which are ordinarily called dorsiferous or annulate ferns. And here I may as well state that I am not prepared to include in my inquiry the genera Schizæa, Osmunda, Aneimia, Botrychium or Ophioglossum; these seem to constitute a parallel and equivalent series to the true ferns, and a group which I altogether eliminate from the present inquiry. It may possibly be observed that this is an incongruous series, its constituent members being isolated, and the whole group resembling a miscellaneous assemblage of individuals huddled together by chance; but to me they possess a far higher interest than this, a far greater value in the universal system: they appear as the remains of an earlier creation, the extinct members of which have been photographed on stone, the impressions alone remaining to assure us that such things were. Mertensia, Gleichenia and Danæa occupy very debateable ground; and without a far more intimate knowledge of them than I have the means of acquiring their true position must remain a mere matter of speculation.

The two modes of growth are so well distinguished by Mr. Smith, in the passage already cited, that little remains to be added. For the sake of precision I will recite the chief diagnostics:—

1st. I call by the name of Rhizophyllaceæ all those ferns which possess a succulent, creeping rhizome, the growing extremity of which never eventuates in a frond; and,

2nd. Cormophyllaceæ, all those which possess an erect or prostrate caudex, the growing extremity of which always eventuates in fronds.

Order RHIZOPHYLLACEÆ.

In the Rhizophyllaceæ the rhizome is generally densely clothed with scales; it produces fronds at every point of its surface, except the growing extremity; these fronds appear at first on the surface of the rhizome, as minute excrescences, displacing a portion of the scaly covering; they are always solitary, always of very slow evolution, and

are always fully evolved before the fructification makes its appearance; their stipes is almost invariably without scales; no part of the stipes of a frond appears, under any circumstances, to become incorporated with the rhizome and form a portion thereof, the rhizome itself remaining succulent until the period of decay, when it dies at one extremity while vigorously growing at the other; these rhizomes are generally, but not always, exposed; they sometimes extend to a great distance beneath the ground; their direction is invariably horizontal. In Europe we have representatives of three very decided families of these rhizophyls, and possibly, also, of a fourth; but of the debateable position of certain ferns between the two main divisions much remains to be said hereafter, when the microscope shall have determined with accuracy the intimate structure of the rhizome. The families which call for an especial notice are, Rhizophylleæ, Davallieæ and Hymenophylleæ; those which occupy the debateable ground are the Hypolepideæ, which I shall place provisionally between Davallia and Hymenophyllum.

Family Rhizophylleæ.

In which the rhizome seems divided irregularly by nodes. At each node originates a solitary frond, "which, after having arrived at maturity, separates by a special articulation formed between the node and the base of the stipes; after the frond has fallen, the node remains in the form of a round concave cicatrix, generally more or less elevated."* The capsules are seated on the back of the frond. It will be sufficient to distinguish three genera.

Genus Rhizophyllum.

In which the veins anastomose, forming a kind of net-work. The examples are Rhizophyllum aureum (Polypodium aureum of Linneus, Pleopeltis aurea of Presl), R. Phymatodes (P. Phymatodes of Linneus, Phymatodes vulgaris of Presl). The whole of the genera Pleopeltis of Humboldt and Bonpland, Drynaria of Bory de St. Vincent, and Phymatodes of Presl, appear to be referrible to this genus. The number of described species is very large, and they constitute the greatest ornaments of our hothouses. The frond is generally pinnatifid or entire, and even in this respect there is a striking uniformity throughout this vast natural association of species.

* Smith *ut supra.*

Genus Ctenopteris.*

In which the veins are simply branched, and the branches free at the extremity; they never anastomose or form a net-work. Example, Ctenopteris vulgaris of Newman (Polypodium vulgare of Linneus). The group is thus characterised by Presl:—"Sori aut omnes aut saltem superiores in apice globuloso venæ venulæve." In the few species with which I am more particularly acquainted the cluster of capsules is seated on the subglobose extremity of the anterior branch of a free, branched vein; this, however, must not be considered characteristic of the genus.

Genus Marginaria.

A most interesting genus, in which the venation differs from that of Ctenopteris in a striking manner; one branch of each system of veins is free and capitulate, the capitulus bearing the cluster of capsules; and the other branches above and below this free branch spread right and left, and then, returning, meet beyond the cluster, forming a circle around it. I believe there are a great number of closely allied species; the fronds of all are simple or pinnatifid.

Family Davallieæ.

In which the rhizome has no obvious division into nodes, and the clusters of capsules are not exposed as in the Rhizophylleæ, but hidden in a marginal or discal cup; the veins are more or less branched, but always free at the extremity. The fronds fall off annually, dehiscing at an articulation close to the base of the stipes; the cicatrix thus left is usually covered by the dense scales, and entirely hidden from sight.

Genus Pachypleuria, &c.

There are three plants known to botanists under the generic names Pachypleuria, Humata and Colposoria, which appear curiously intermediate between Ctenopteris and Davallia. The rhizome is exposed, rather slender, scandent, and densely scaly; the fronds simple or pinnatifid; the veins branched, the extremities bearing the clusters of

* The generic name Ctenopteris appears to have been differently employed by Mr. Smith; if prior to my using it, in the sense now intended, of course my name will fall. The name Ctenopteris, as now restricted, is, however, of long standing, first, I think, employed by Blume, afterwards by Presl.

capsules on the disk near the margin. The first of these is Pachypleuria Guimardiana (Nephrodium Guimardianum of Gaudichaud); Humata pectinata of J. Smith and Davallia pectinata of Sir J. E. Smith are the same plant. The second is Humata pinnatifida (Davallia pinnatifida of Swartz), and the third is Colposoria angustata of Presl (Davallia angustata of Hooker and Greville).

Genus Davallia.*

In which the rhizome is extremely stout and the fronds very much divided. Example, Davallia canariensis of Smith, under which name it appears to me that several Atlantic species have been hitherto united; they are universally cultivated, and familiar to all botanists.

Family Hypolepideæ.

In which the rhizome extends with great rapidity, sometimes on the surface and sometimes under ground; it is covered with a dense, erect down, differing much in appearance from the large, appressed scales of Davallia canariensis. The undeveloped frond emerges from the rhizome at distant intervals, and, except in its erect position, at right angles with the rhizome, it closely resembles that organ, its substance and clothing being identical; it is not articulated at the base, and the basal portion of the stipes of many years are often found adherent to the rhizome. The fronds have long stipes and a deltoid outline; they are of very large size, and are remarkable for the extremely rudimentary state when first evolved from the rhizome; the fructification is marginal, and partially covered by the reflexed margin of frond. I notice three genera, each containing many species.

Genus Hypolepis.

In which the marginal fructification is interrupted or punctiform, and the velvety rhizome exposed. The example is a most familiar

* The genus Davallia of Sir J. E. Smith, Presl and Hooker appears to be composed of very heterogeneous species. Even in the fructification, the only character employed as distinctive, I find little or no similarity. Under these circumstances, there seems an obvious impropriety in assigning the names Davallieæ and Davallia to the restricted and altered groups; but, on the other hand, it would appear most arbitrary to call the familiar Davallia canariensis by another name,

Incidit in Scyllam qui vult vitare Charybdim.

The genus now indicated has nothing more to do with the genus Davallia of Smith, &c., than that it contains one of the species.

plant, commonly known as Hypolepis repens; but I fear the name has been changed by recent writers, and probably another name will be required for the genus, as many cormophyls, of the genus Cheilanthes, have lately been mixed up with rhizophyllaceous species, under the name of Hypolepis.

Genus Litolobium.

In which the fructification is marginal and punctiform, and the rhizome subterranean. Example, Litolobium punctilobulum, a plant that has received an endless variety of names; it is very abundant in the United States.

Genus Eupteris.

In which the marginal fructification is continuous. Example, Eupteris aquilina (the Pteris aquilina of Linneus), perhaps the most abundant and familiar fern in the whole world. I will not give an opinion whether the various forms now associated under the name of aquilina constitute a single species or many; but I observe that an extended knowledge of ferns is invariably accompanied by a tendency to reduce the number of species.

Family Hymenophylleæ.

In which the rhizome is slender and wiry; the frond semidiaphanous, composed of compoundly divided, winged veins; the stipes persistent and not articulated; the fructification in marginal cups. A most natural family, including twenty genera, some of which I feel disposed to believe it desirable to drop: I believe all the species with with which I am acquainted may be incorporated in three genera.

Genus Loxsoma.

Of which the characters are given thus:—"Sori marginal, pointing forward, but partially sunk in the axil of a tooth or lobe from the apex of a vein. Involucres suburceolate, coriaceous, the outer apparently formed of a changed portion of the frond; the mouth truncated, entire." Example, Loxsoma Cunninghami.

Genus Trichomanes.

In which the seeds are seated on a naked vein, the basal portion of which, to which the capsules are adherent, is surrounded by a cup, the apical portion projecting like a bristle. Example, Trichomanes

speciosum or radicans, a native of the Atlantic Islands and of Ireland.

Genus Hymenophyllum.

In which the receptacle does not project beyond the cup, a trivial and seemingly very unimportant character. Example, Hymenophyllum unilaterale of Willdenow, the smallest of British ferns, very common on stones and trunks of trees near waterfalls in the North of Europe, some parts of Scotland, and the South-west of Ireland. About a hundred other names of species exist.

Presl, in his beautiful work intituled 'Hymenophyllaceæ,' published in Prague, in 1843, has given a complete and masterly digest of this previously obscure and little-known family, which he divides into nineteen genera, exclusive of Loxsoma. It is the first and only instance within my knowledge in which a natural group of ferns has been carefully worked out. The genera in addition to Trichomanes are, Feea, Hymenostachys, Lecanium, Cardiomanes, Ragatelus, Cephalomanes, Neurophyllum, Microgonium, Abrodyctyum, Didymoglossum, Meringium, Hemiphlebium, Leptocionium, Myrmecostylum, Ptychophyllum, Hymenophyllum, Sphærocionium and Hymenoglossum.

Order CORMOPHYLLACEÆ.

In the Cormophyllaceæ the caudex is generally erect, but sometimes prostrate; its growing extremity is always composed of undeveloped fronds; it is almost invariably without scales; the fructification is formed before the unfolding of the fronds; their stipes is generally densely covered with chaffy scales; the stipes are spatulate at the base, sometimes wholly, always partially, clasping the caudex, with which they are continuous, and of which their bases eventually form a part. There are probably many families: three are very familiar to botanists.

Family CORMOPHYLLEÆ.

The caudex vertical, developed above the surface of the ground, forming a true trunk, much resembling that of phænogamous trees. All the species may be comprised in the

Genus Cormophyllum,

the characters of which will of course be those of the family. This genus contains the tree-ferns, of which one hundred and forty species

have been named and described. Of these, Cormophyllum horridum (Polypodium horridum of Linneus, and Hemitelia horrida of Robert Brown), Cormophyllum arboreum (Polypodium arboreum of Linneus, and Cyathea arborea of Smith), and Cormophyllum capense (Polypodium capense of Linneus, and Alsophila capensis of John Smith), may serve as examples. The three genera Hemitelia, Cyathea and Alsophila have never been distinguished by any natural character; but the genus Cormophyllum may possibly be divided hereafter; the venation seems to offer diagnostics.

Family Dryopterideæ.

The caudex vertical, but subglobose or tufted, never forming a trunk, but always exhibiting a crown of undeveloped fronds. This family contains all our most familiar ferns. Dryopteris Filix-mas, Polystichum aculeatum, Athyrium Filix-femina, Pseudathyrium alpestre, Asplenium Adiantum-nigrum, and Notolepeum Ceterach are familiar examples.

Family Rhizocormeæ.

In which the caudex creeps horizontally in the earth, extending itself in various directions; the fronds being solitary and distant; the growing point of the root-like caudex is, however, invariably composed of undeveloped fronds. Examples, Hemestheum Thelypteris, (the Polypodium Thelypteris of Linneus), Gymnocarpium Dryopteris (the Polypodium Dryopteris of Linneus).

Family Pteridеæ.

Crown less scaly; stipes less scaly; fructification marginal. Examples, Blechnum spicant, Pteris longifolia, Cheilanthes odora, Adiantum Capillus-Veneris.

That these families do not comprise all the annulate ferns I am well aware; but they comprise all the more conspicuous groups; and none of those which are omitted offer, as far as I am aware, any serious obstacle to the physiological arrangement. The order in which they are here described is not intended to show anything of the relationships which exist among them. These cannot readily be expressed on paper. Perhaps the following formula may give some idea of my views on this subject; and it must be observed that some of the families

RHIZOPHYLS	CORMOPHYLS
Davallieæ	Dryopterideæ
Rhyzophylleæ	Cormophylleæ

Hypolepideæ—Rhizophylleæ

Hymenophylleæ	Pterideæ

appear to offer a very obvious dichotomous division, as Dryopterideæ into the chaffy-stiped Filix-mas and congeners, and the glabrous-stiped Asplenium Adiantum-nigrum. Supposing a series of the cormophyls to commence with Filix-mas, it passes readily through the Polystichums, Lophodiums and Athyriums to the true Aspleniums; leaving these by Amesium, we may enter into the next family by Adiantum; and, quitting it by those species of Pteris which have the habit of the Gymnocarpiums, we pass to that genus, and then to Thelypteris, and from this to Oreopteris among the Dryopterideæ. Within this circle is enclosed the typical family of tree-ferns. The rhyzophyls appear to offer a series somewhat similar—Davallia, Loxsoma, Hymenophyllum, Trichomanes, Eupteris and Hypolepis, which, again, approaches Davallia. Within this second circle is enclosed the typical family of Rhizophylleæ, now first isolated, but so well marked by Nature that no one can mistake them.

Edward Newman.

Note on Pseudathyrium flexile. By Edward Newman.

Pseudathyrium flexile, *Newm.*

Caudex massive, its position erect, its crown gibbous, scaly. *Fronds* produced in succession throughout the summer, at first somewhat ascending, then elbowed at about one-eighth of their length and spreading horizontally, lax, flexile, the flexibility arising from the tenuity of the rachis; perfectly estipitate, linear-lanceolate. *Pinnæ* short, distant, deflexed, blunt, pinnate. *Capsules* in circular clusters, very crowded at the base of frond, gradually decreasing in abundance

towards the apex, where they are often entirely wanting, always distant and scattered. *Involucre* very distinct at first, its insertion oblique, its disk almost flat, its tendency rather to concavity than convexity, its margin irregular but scarcely lacerated.

Habitat. Glen Prosen, in Scotland. Found also in Lithuania, Siberia, Kamschatka. Extremely local.

The reader is referred to 'History of British Ferns,' pp. 204 and 205, for a more detailed description. The additions and corrections above are—1st, the elbowed character and spreading habit of the fronds; 2nd, their successive and not simultaneous development; 3rdly, the crowded fructification at the base, in which this species is quite isolated among European ferns; and, 4thly, the distinct involucre, which was at first entirely overlooked.

Much has been said of the difficulty of distinguishing this species from Pseudathyrium alpestre; but this difficulty is imaginary. In many instances botanists have obligingly sent me the supposed flexile, the supposed intermediates, and supposed alpestre, in order to convince me of the nullity of this species. In these instances flexile has *never* occurred among the contrasted forms, alpestre *rarely*. The fronds in nine cases out of ten have proved Athyrium Filix-femina, the seedling forms being supposed to be flexile, and the fronds of a few rather older plants, intermediates. In a few instances Cystopteris fragilis has been sent as flexile. In the discussions on this fern, as well as in those on Fœnisecii and uliginosum, the dissentient opinions arise from non-acquaintance with the form under discussion: it tends to no good purpose to discuss the similarities or differences of two objects if we have only knowledge of one. I believe, in the case of uliginosum, that the disputants have no knowledge whatever of the plant, first described by Doll and afterwards by myself. My friend Mr. George Maw, of Brosely, than whom a more sincere truth-seeker or a more diligent inquirer never lived, appears to me quite to have mistaken the plant intended; none of the specimens distributed as uliginosum by this liberal botanist possess the distinguishing character, "pinnules adnate or decurrent," which occur in each of the published descriptions, and emphatically separate this plant from Lophodium spinosum.

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